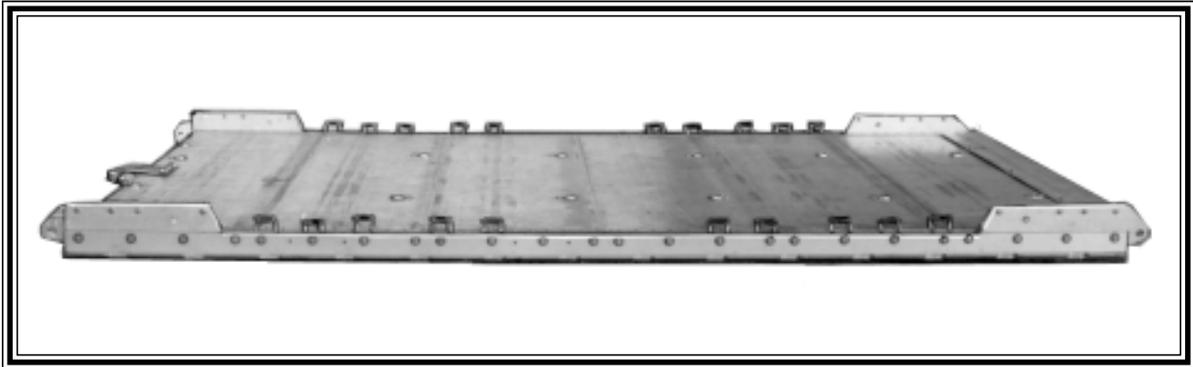




**AIRDROP OF SUPPLIES AND EQUIPMENT:**

# **RIGGING AIRDROP PLATFORMS**



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**HEADQUARTERS  
DEPARTMENT OF THE ARMY  
DEPARTMENT OF THE NAVY  
DEPARTMENT OF THE AIR FORCE**

FIELD MANUAL  
NO 4-20.102  
NAVAL SEA COMMAND  
NO SS400-AB-MMO-010  
TECHNICAL ORDER  
NO 13C7-1-5

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
DEPARTMENT OF THE NAVY  
DEPARTMENT OF THE AIR FORCE  
Washington, DC 22 August 2001

**AIRDROP OF SUPPLIES AND EQUIPMENT:  
RIGGING AIRDROP PLATFORMS**

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\* This publication supercedes FM 10-500-2/TO 13C7-1-5, dated 1 November 1990.

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## PREFACE

### SCOPE

The purpose of this manual is to provide the latest approved procedures for rigging airdrop platforms. This manual is written for use by the parachute rigger. It consists of three chapters.

The procedures contained in this manual are typical and serve as the standard from which all platform rigging is derived. Due to the uniqueness of some equipment and items, the procedures in a specific rigging manual may be different from those in this manual. When procedures are different, those in the specific manual will be followed. When an item of equipment is specified to be used for which its minimum or maximum capacity is exceeded, a notice of exception will be printed at the beginning of each paragraph in each rigging manual where the exception is authorized. When an item of airdrop equipment is replaced or a procedure is changed, it will be impossible to change all manuals in the field at one time. Therefore, this manual will be changed, when necessary.

Chapters 1 and 2 contain specific limitations and general information about the rigging of airdrop platform loads for low-velocity airdrop from US aircraft.

Chapter 3 shows and tells how to prepare, attach, and safety tie some of the components and systems used in the specific rigging manuals of the FM 4-20 (10-500)/TO 13C7 series.

**Note: LAPES and the 60K Low-Velocity Airdrop System have been taken out of this manual. If in the future these systems are needed in the field, they will be added back into this manual.**

### USER INFORMATION

The proponent of this publication is HQ TRADOC. You are encouraged to report any errors or omissions and to suggest ways of making this a better manual.

Army personnel, send your comments on DA Form 2028 directly to:

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## Chapter 1

# Airdrop Information

### RESPONSIBILITIES

1-1. Personnel responsible for loading rigged platform loads into aircraft and installing and operating airdrop systems are given below.

*a. US Air Force Aircraft.* Air Force personnel are responsible for loading the rigged platform loads into the aircraft and for installing and operating the airdrop system.

*b. US Air Force Aircraft Foreign Joint Training.* USAF aircraft and crews conducting joint airdrop operations with foreign military governments are not authorized to airdrop equipment and configurations not included in this manual, unless authorized by specific MAJCOM.

*c. Other Aircraft.* When aircraft other than US Air Force aircraft is used, Army personnel may be responsible for loading Army rigged platform loads into the aircraft and for installing and operating the airdrop systems.

### TYPE AND METHOD OF AIRDROP

1-2. As used in this manual, airdrop is the air-to-ground delivery of platform loads from an aircraft in flight. Airdrop is designed to supplement the usual surface methods of delivering supplies and equipment to forces in the field.

*a. Type of Airdrop.* Currently the only type of airdrop used to deliver platform loads is low-velocity airdrop. Low-velocity airdrop delivers platform loads from an aircraft at various altitudes. Cargo parachutes are used to slow the descent of the loads to ensure minimum landing shock. The type and number of cargo parachutes can vary as shown in Table 1-1. Due to differing deployment characteristics, parachutes of different types will not be mixed on the same load. Loads with different type parachutes and loads with quantities of the same type parachute may be airdropped from the same aircraft or element provided the following conditions are met:

(1) Airdrop altitude for the aircraft or element will be determined by the type and number of parachutes on the load requiring the highest airdrop altitude.

(2) Aircraft or elements with lower airdrop altitudes will drop before aircraft or elements with higher airdrop altitudes.

(3) The transported force accepts strike report responsibility for loads other than the first platform to exit the aircraft or element lead for formation airdrops.

Table 1-1. Type and Number of Parachutes for Low-Velocity Airdrop

MINIMUM DROP ALTITUDE (FEET AGL)	PARACHUTES
700 750	<b>G-11B</b> 1 2 to 4
1,200 1,300	<b>G-11C</b> 5 to 7 8
475 550	<b>G-12E</b> 1 2

**CAUTION**  
Drop altitudes reflect MINIMUM drop altitudes.

*b. Method of Airdrop.* The extraction method is used for platform loads delivered by low-velocity airdrop. This method uses a cargo extraction parachute to pull the platform load from the cargo compartment of the aircraft.

**MAXIMUM RIGGED WEIGHT**

1-3. The weight cited in the rigged load data for each specific load is typical for the load as shown. Some amount of overweight is allowed as long as load dimensions, rigging and extraction components, and rigging procedures are not changed.

**Note: When a maximum allowable rigged weight is specified in the rigged load data, this weight is the absolute maximum and will not be exceeded.**

## ACCOMPANYING LOADS

1-4. Accompanying loads are items of supplies and equipment that may be added to a certain primary load as specified in the specific rigging manual for that load. Each airdrop manual states whether an accompanying load is authorized and lists the restrictions for that particular load. The following restrictions apply to all accompanying loads.

**a.** The accompanying load must be positioned so that--

- (1) The primary load will not hit or crush it on ground impact.
- (2) It will not interfere with the suspension slings.

**b.** The accompanying load must not cause the--

(1) Height of the rigged load to exceed the height limitations and the tip-off curve (Table 1-2) of the aircraft used.

(2) Weight of the rigged load to exceed the maximum allowable weight prescribed in the specific rigging manual.

(3) Center of balance (CB) of the rigged load to move outside the limitations shown in Figure 1-1.

(4) Hang angle of the suspended rigged load to exceed 1 inch per linear foot of platform length.

### CAUTION

**The accompanying load must be lashed to meet the same restraint requirements as the primary load.**

## CENTER OF BALANCE

1-5. The CB of an airdrop platform load, based on the total rigged weight, is given in the rigging manual for a particular item. If the load varies from the one given in a particular manual, the CB must be recomputed using the procedures shown in Figure 1-2. If the recomputed CB or load profile exceeds the limits of Table 1-2 or Figure 1-2, the load is not acceptable.

Table 1-2. Forward Profile Limits for Airdrop Platforms

**FORWARD PROFILE LIMITS (Tip Off Curve)**

<b>DISTANCE FORWARD OF CB (INCHES)</b>	<b>MAXIMUM HEIGHT (INCHES)</b>	<b>DISTANCE FORWARD OF CB (INCHES)</b>	<b>MAXIMUM HEIGHT (INCHES)</b>
0 to 45	100	153 to 155	82
46 to 75	99	156 to 160	81
76 to 87	98	161 to 162	80
88 to 93	97	163 to 165	79
94 to 100	96	166 to 168	78
101 to 107	95	169 to 170	77
108 to 113	94	171 to 172	76
114 to 117	93	173 to 174	75
118 to 122	92	175 to 177	74
123 to 124	91	178 to 179	73
125 to 128	90	180 to 181	72
129 to 133	89	182 to 183	71
134 to 138	88	184 to 186	70
139 to 141	87	187 to 188	69
142 to 144	86	189 to 190	68
145 to 146	85	191 to 192	67
147 to 150	84	193 to 195	66
151 to 152	83	196 to 197	65

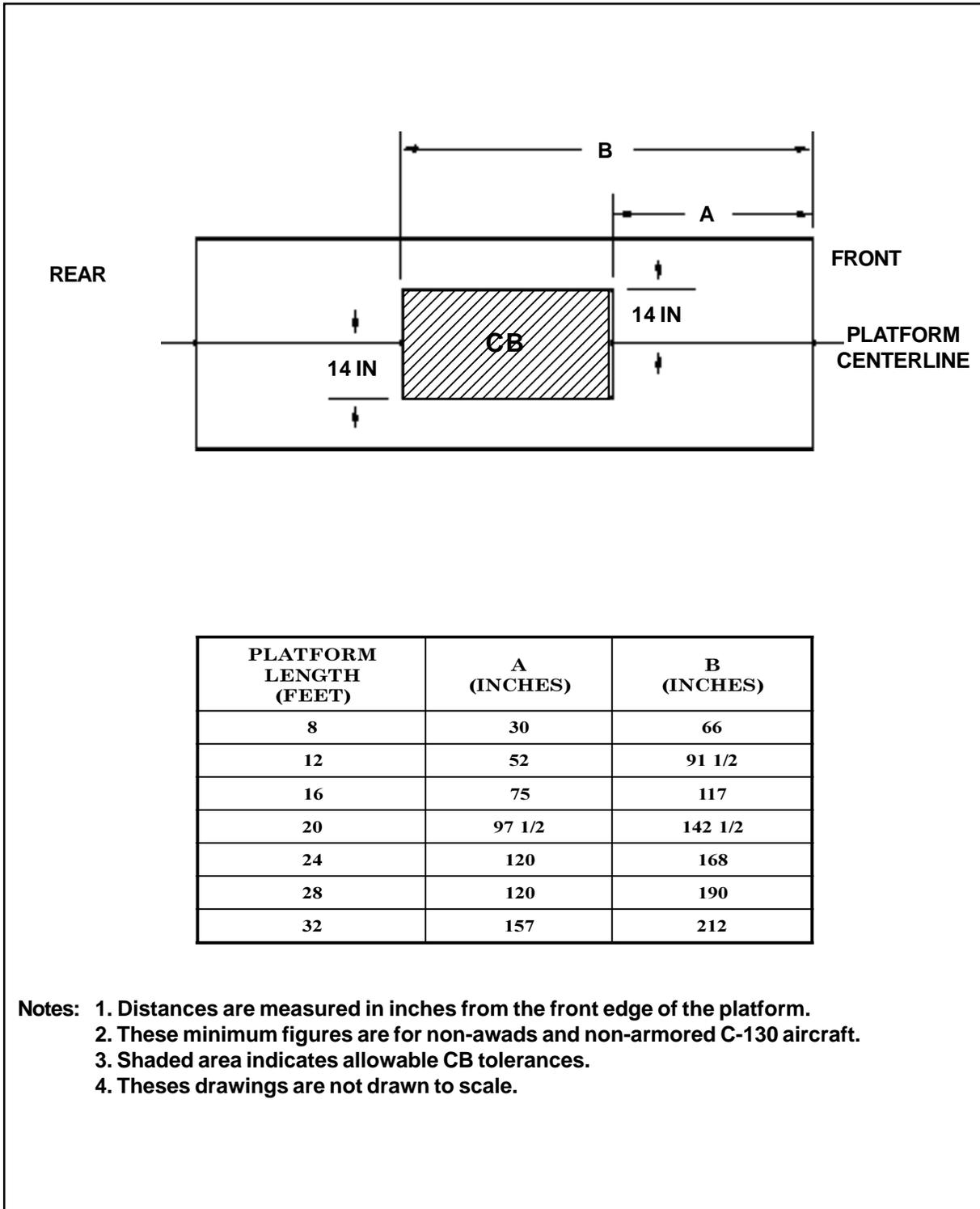


Figure 1-1. CB Limits for Airdrop Platforms

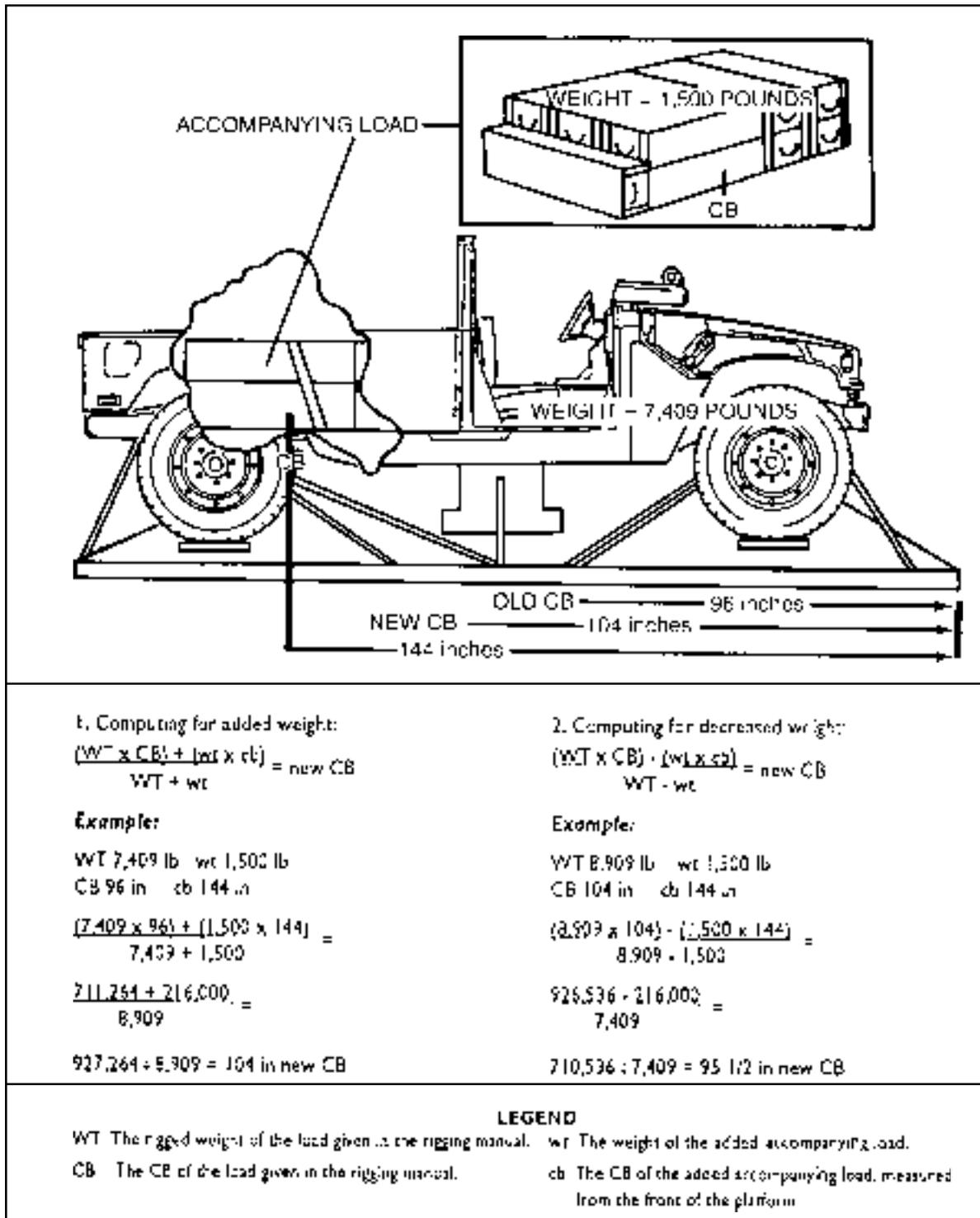


Figure 1-2. Drawing Showing Weights and CB of Rigged Item and Accompanying Load

## ITEMS AND LOADS DROPPED IN COLD CLIMATES

1-6. Some items to be dropped may have been modified for use in cold climates by the installation of extra equipment. Special rigging procedures may be needed when the drop item has been so modified. When loads are to be dropped in cold climates, all excess webbing of suspension slings and tie-down straps must be folded and tied with type I, 1/4-inch cotton webbing.

## SAFETY PRECAUTIONS

1-7. Safety precautions **MUST** be closely followed when airdrop platform loads are rigged. Failure to follow the precautions could result in serious injury to the rigger or damage to the drop item or aircraft. The following safety precautions shall be taken by the rigger:

*a.* Make sure that when lifting heavy items, the lifting device has a rated lifting capacity that exceeds the weight of the item to be lifted.

*b.* Be sure that items being lifted are secured to the lifting device.

*c.* Avoid working under equipment suspended above an airdrop platform unless absolutely necessary.

*d.* Cover all wet cell batteries in service with plastic or nonflammable material.

*e.* Check fuel tanks to ensure that they do not exceed the fuel level of the specific rigging manuals. Check fuel tanks of small engines to make sure they are drained. Check fuel cans to make sure they are performance-oriented packaging approved. When stowing fuel cans, use cellulose wadding or other suitable material to prevent metal-to-metal contact.

*f.* Package, mark, and label hazardous materials according to AFJMAN 24-204/TM 38-250.

**CAUTION**  
Only ammunition listed in FM 10-500-53/MCRP 4-3.8/  
TO 13C7-18-41 may be airdropped.

## KNOTS

1-8. Some of the knots used for rigging platform loads are shown in Figure 1-3.

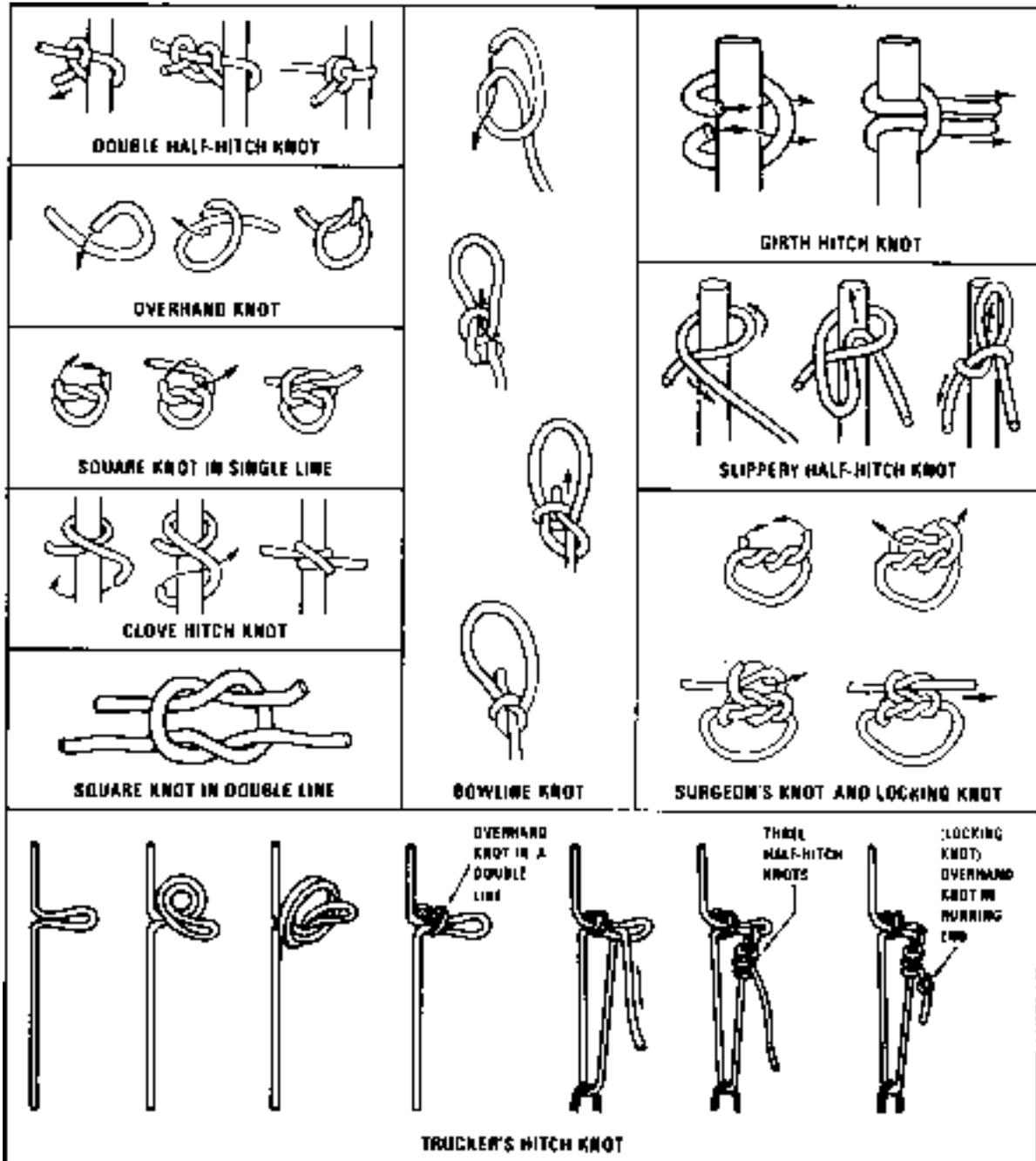


Figure 1-3. Knots Used During Rigging

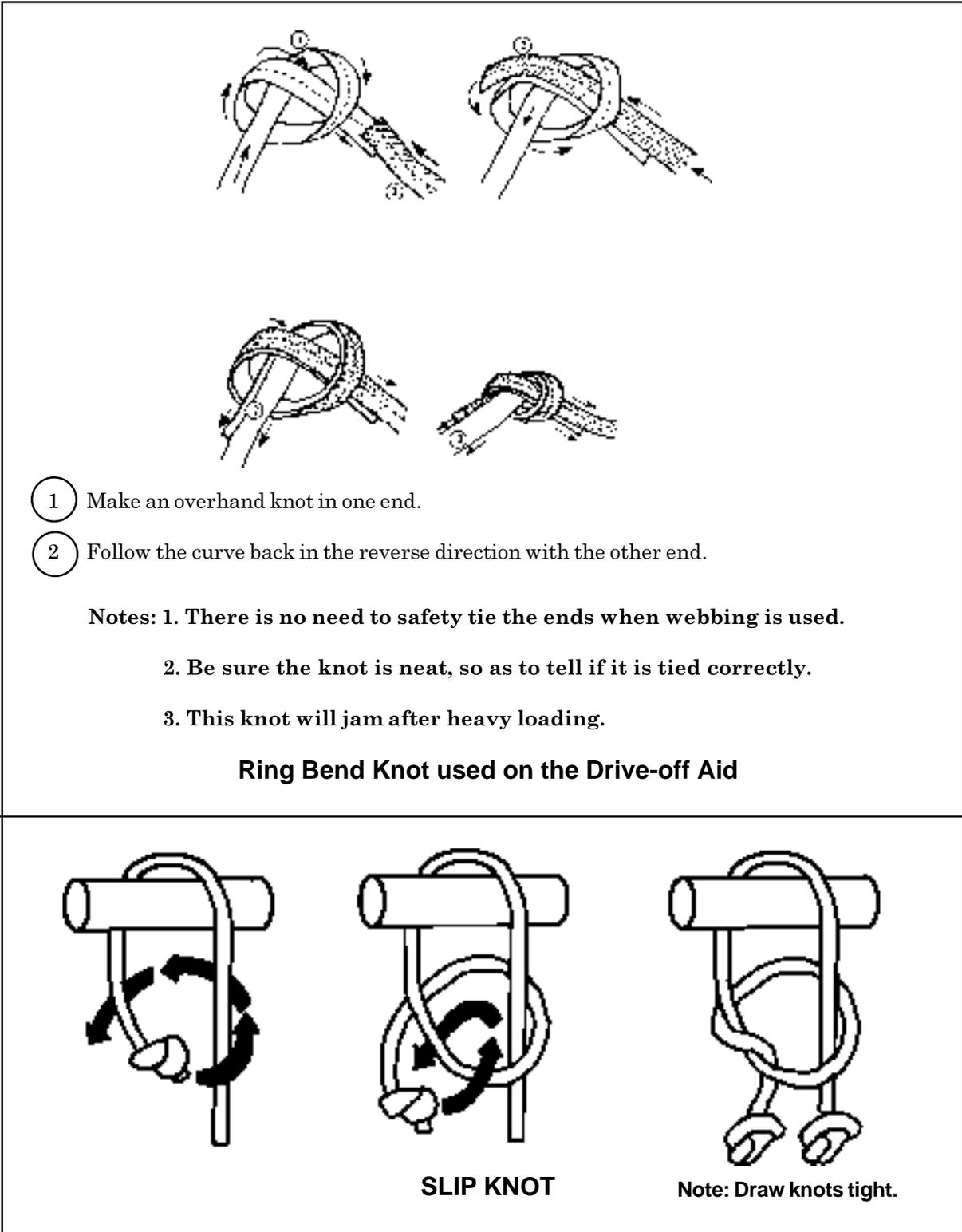


Figure 1-3. Knots Used During Rigging (Continued)

## Chapter 2

# Rigging Information

## Section I

### The Type V Airdrop Platform

#### USE

2-1. The type V airdrop platform, as shown in Figure 2-1, serves as the base on which supplies and equipment are restrained. This platform also supports the load during the extraction, parachute deployment, suspension, and recovery phases. The type V airdrop platform is used for low-velocity airdrop. The type V platform can be assembled in 8-, 12-, 16-, 20-, 24-, 28-, and 32-foot lengths. The assembled platform is 108 inches wide. A detailed description of this platform is in TM 10-1670-268-20&P/TO 13C7-52-22. The nose bumper is not required. The type V platform spreads the shock of ground impact. Limitations for the type V platform are listed in Table 2-1.

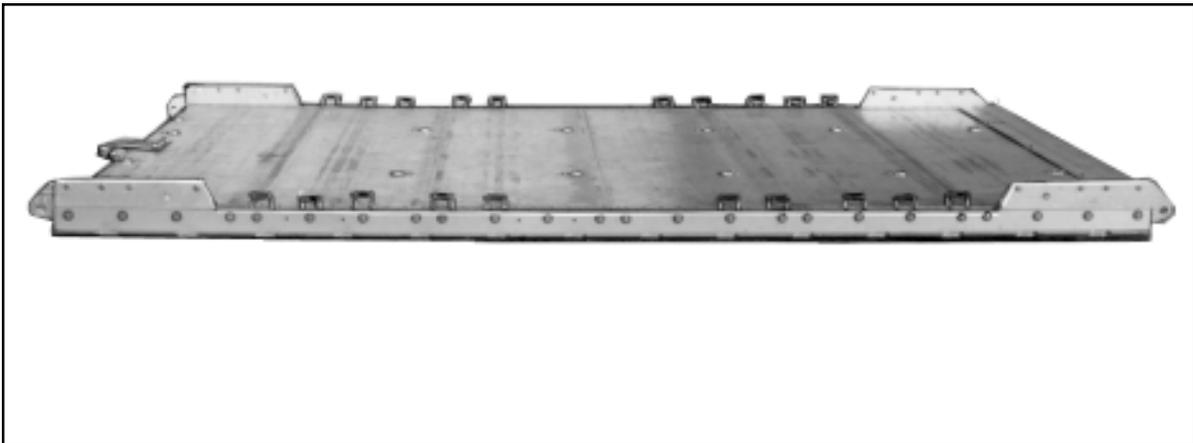


Figure 2-1. Type V Airdrop Platform

Table 2-1. Limitations for Type V Airdrop Platform when Dropping from a C-130, C-141, C-5, and C-17 Aircraft

**C-130, C-141, and C-5 Aircraft**

Length (Feet)	Width (Inches)	Weight (Pounds)	Platform Surface (Square Feet)	Minimum Rigged Weight (Pounds)	Maximum Rigged Weight (Pounds)
8	108	820	72	2,520	15,000
12	108	1,220	108	3,780	21,000
16	108	1,590	144	5,040	28,000
20	108	1,950	180	6,300	39,000
24	108	2,280	216	7,560	42,000
28	108	2,820	252	8,820	42,000
32	108	3,056	288	10,080	42,000

**C-17 Aircraft**

Length (Feet)	Width (Inches)	Weight (Pounds)	Platform Surface (Square Feet)	Minimum Rigged Weight (Pounds)	Maximum Rigged Weight (Pounds)
8	108	820	72	2,520	*10,000
12	108	1,220	108	3,780	*18,500
16	108	1,590	144	5,040	*27,700
20	108	1,950	180	6,300	39,000
24	108	2,280	216	7,500	42,000
28	108	2,820	252	8,820	42,000
32	108	3,056	288	10,080	42,000

\* Aircraft restraint rails reduce the weight

## PLATFORM LIMITATIONS FOR AIRCRAFT

2-2. Cargo and transport aircraft are specifically designed to deliver supplies and equipment by airdrop and are employed in airborne operations. Aircraft limitations are described below.

**a. Hercules (C-130).** Platform loads are generally restricted to a height of 100 inches (measured from the bottom of the platform) and weight of 25,000 pounds for aircraft with an aircraft serial number of 62-1783 or lower. For aircraft with an aircraft serial number of 62-1784 and higher, and for aircraft with a serial number of 61-2358, the weight restriction is 42,000 pounds. MC-130E Combat Talon I and MC-130H Combat Talon II aircraft are restricted to 35,000 pounds. Single and combined platform lengths are restricted to 28 feet for MC-130E Combat Talon I aircraft and 40 feet of available floor space for all other C-130 aircraft. When the towplate is used for Drogue Extraction System (DES) airdrops, the extraction/drogue parachute requirements in Table 2-10 will apply. DES is the primary method of extraction for Combat Talon aircraft.

**b. Starlifter (C-141).** Platform loads are generally restricted to a height of 100 inches (measured from the bottom of the platform) and a weight of 38,500 pounds. During contingency (wartime) operations, with Air Force approval, the maximum platform weight may be increased to 42,000 pounds. For multiple platforms, up to 70,000 pounds of airdrop load may be airdropped. The aircraft has a total available floor space of 93 feet.

**c. Galaxy (C-5).** Platforms are generally restricted to a height of 105 inches (measured from the bottom of the platform) and a weight of 60,000 pounds. For multiple platforms, up to 200,000 pounds of airdrop load may be airdropped. All loads certified for low-velocity airdrop from C-130, C-141 and C-17 aircraft may be airdropped from C-5 aircraft. The aircraft has a total available floor space of 121 feet.

**d. Globemaster (C-17).** Platform loads are generally restricted to a height of 118 inches. Platform loads are generally restricted to a weight of 60,000 pounds. For multiple platforms, up to 110,000 pounds of airdrop load may be airdropped. Loads certified for low-velocity airdrop from C-130, C-141, and C-5 aircraft that meet the limitations in Table 2-1 may be airdropped from the C-17 aircraft. The aircraft has a total available floor space of 64 feet.

## Section II

# Airdrop Supplies And Equipment

## COMMONLY USED ITEMS

2-3. Items commonly used for rigging platform loads are described in this section. Each rigging manual in the FM 4-20.(10-500)/TO 13C7 series contains one or more tables of equipment required. These tables list the NSN, item, and quantity of each item needed to prepare and rig the load covered in the manual. Standard airdrop hardware items are shown in Figure 2-2. Standard airdrop straps and canvas items are shown in Figure 2-3. Some textile, wood, and miscellaneous items are described below.

*a. Textile Items.* The most common textile items and their uses are as follows:

(1) **Type III nylon cord** is used to make safety ties and to hold items in place. It has a tensile strength of 550 pounds.

(2) **1/2-inch tubular nylon webbing** is used to secure items during airdrop and to tie the deadman's safety tie. It has a tensile strength of 1,000 pounds.

(3) **Type I, 1/4-inch cotton webbing** is used to make many of the needed safety ties used when a platform load is rigged. It has a tensile strength of 80 pounds.

(4) **5/8-inch or 9/16-inch tubular nylon webbing** may be used for the deadman's safety tie and parachute clustering ties in place of 1/2-inch tubular nylon webbing. Five eighths inch tubular nylon webbing has a tensile strength of 2250 pounds and 9/16-inch tubular nylon webbing has a tensile strength of 1500 pounds.

**b. Wood Items.** Wood items used when platform loads are rigged for specific airdrop are made locally. Details for building these wood items are in the rigging manuals.

**Note: Plywood will be grade AC or AD.**

**c. Miscellaneous Items.** Miscellaneous items that may be used when a platform load is rigged are discussed below. The proper use of these items will be covered in detail in this manual or in other FM 4-20 (10-500)/ TO13C7 series manuals.

(1) **Adhesive tape (masking tape), 2 inches wide**, is used to secure folds of excess webbing. It is also used to protect honeycomb from being cut by type III nylon cord and to hold padding in place. It can be used for other tasks also.

(2) **Type IV, cloth-back adhesive tape, 2 inches wide**, is used to protect honeycomb from being cut by type III nylon cord and to hold padding in place. It can be used for other tasks also.

**CAUTION**  
The type IV, cloth-backed adhesive tape, will not be used to secure folds of extraction lines and deployment lines.

(3) **Cellulose wadding and felt sheets** have many uses. They may be used to pad fragile items, to prevent sharp edges from cutting, and to protect slings during airdrop.

(4) **Energy-dissipating pads (honeycomb)** are used to absorb the landing shock. Honeycomb is also used to level, pad, and fill empty spaces.

## INSPECTION OF ITEMS

2-4. Canvas, metal, webbing, and wood items are inspected according to TM 10-1670-296-20&P/TO 13C7-49-2.

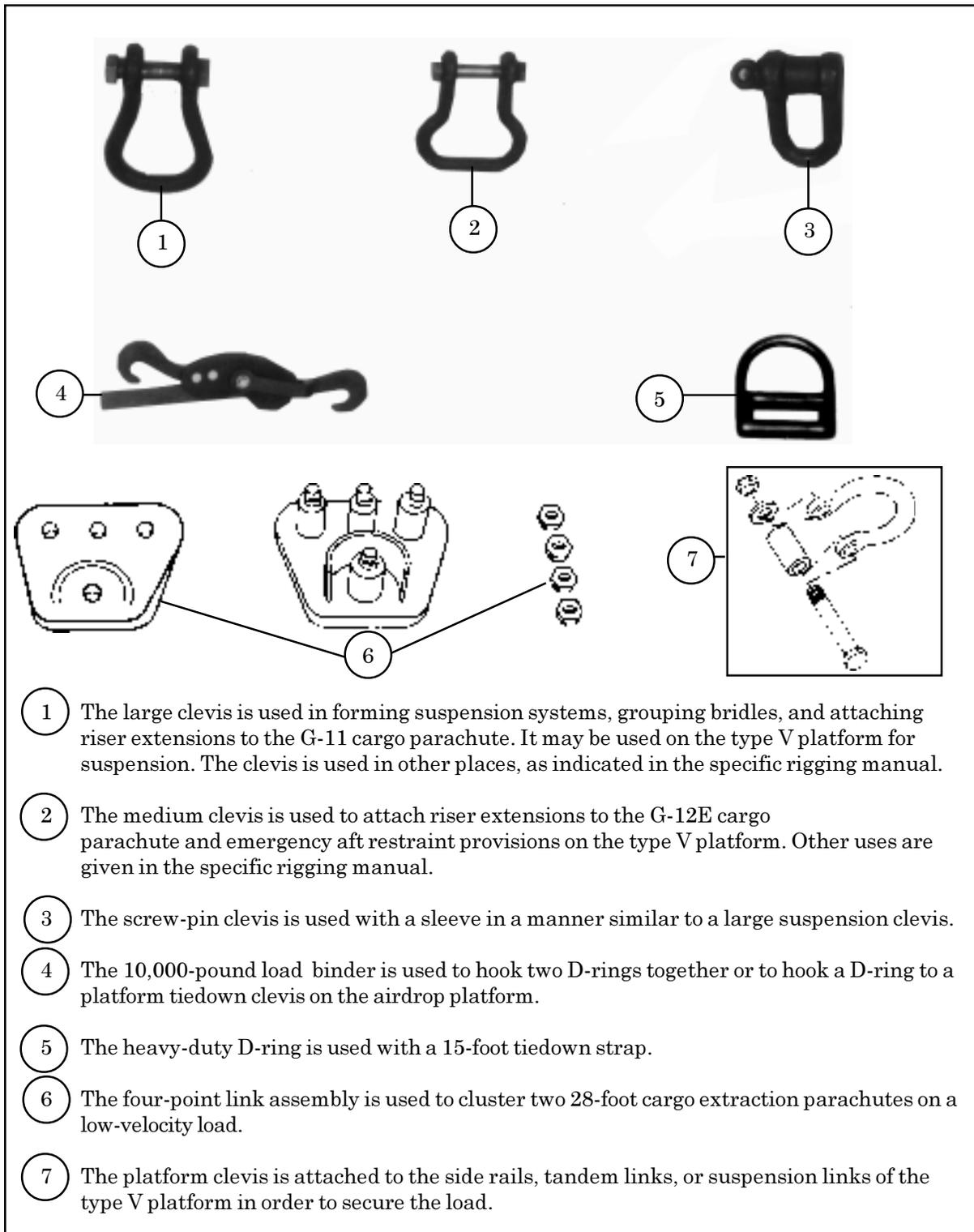
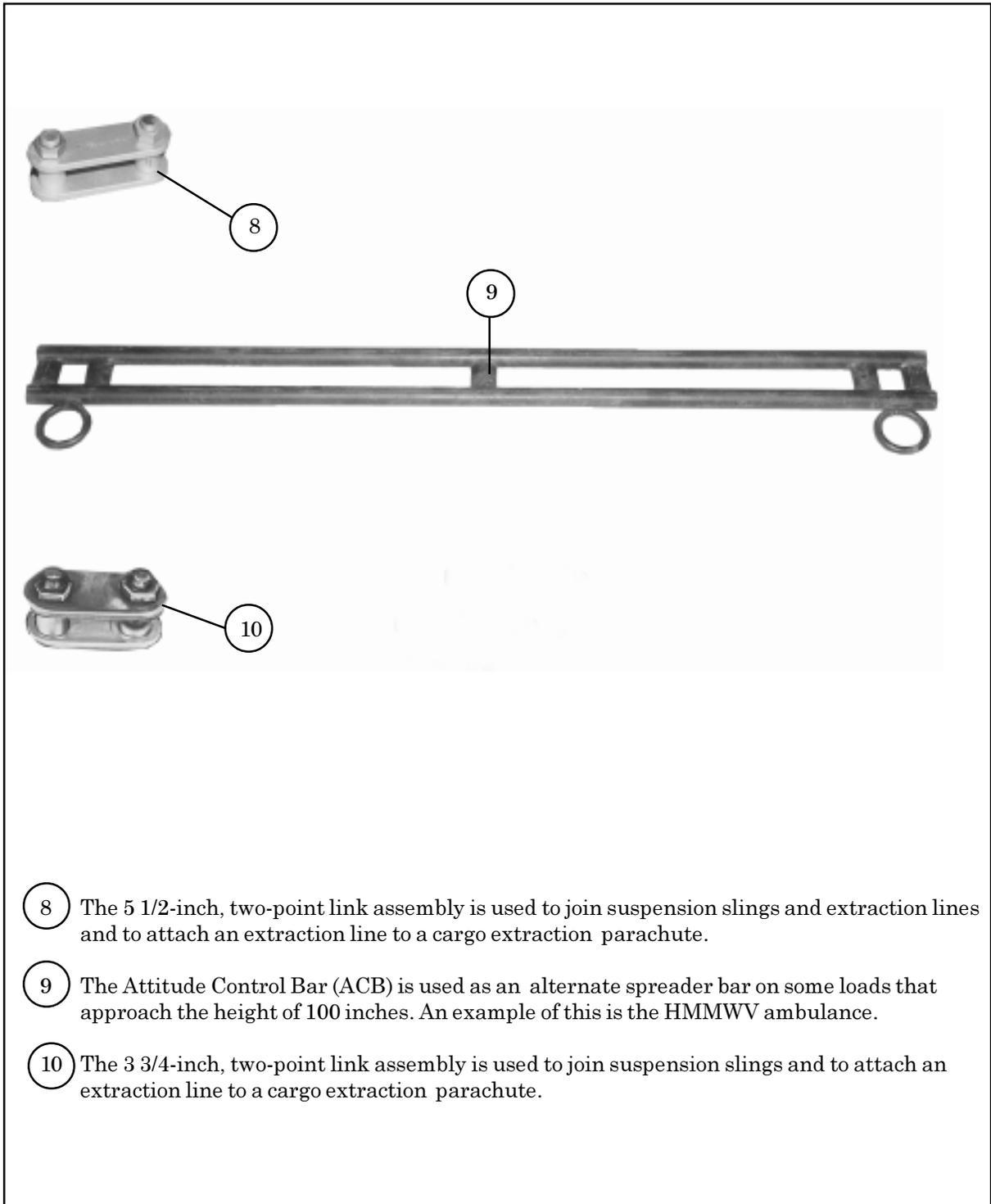
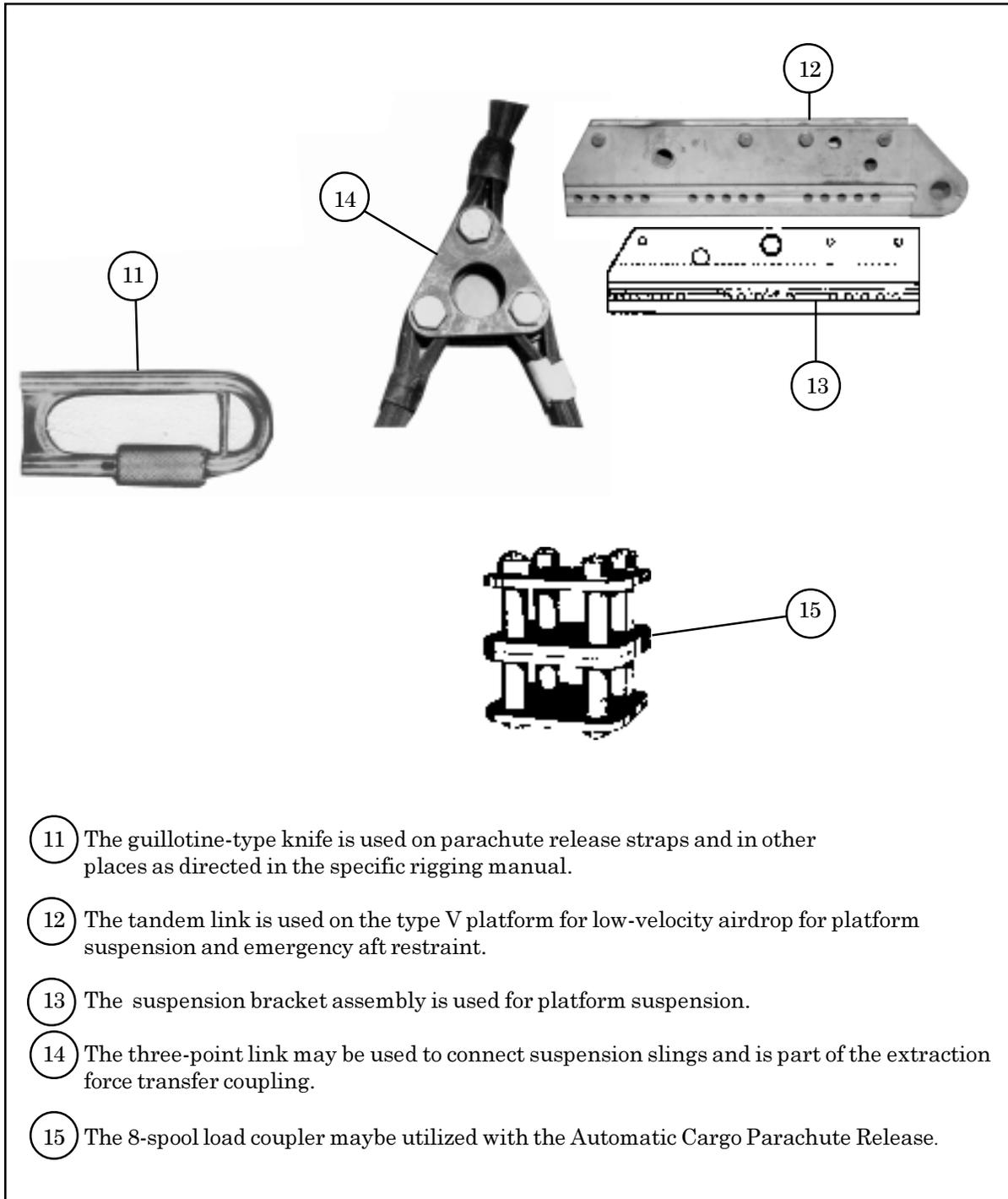


Figure 2-2. Hardware Items Used for Rigging Platform Loads



- 8 The 5 1/2-inch, two-point link assembly is used to join suspension slings and extraction lines and to attach an extraction line to a cargo extraction parachute.
- 9 The Attitude Control Bar (ACB) is used as an alternate spreader bar on some loads that approach the height of 100 inches. An example of this is the HMMWV ambulance.
- 10 The 3 3/4-inch, two-point link assembly is used to join suspension slings and to attach an extraction line to a cargo extraction parachute.

**Figure 2-2. Hardware Items Used for Rigging Platform Loads (continued)**



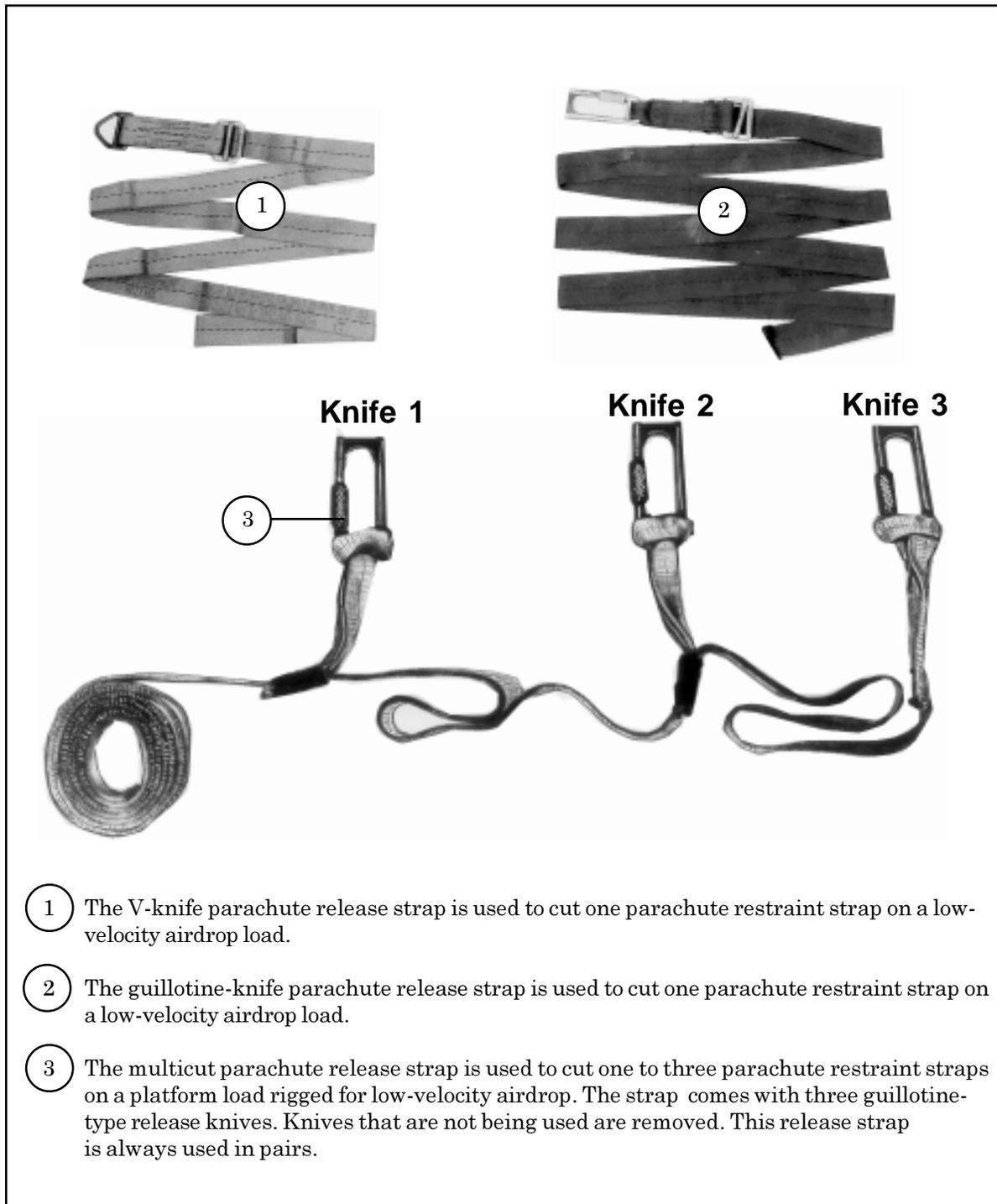
**Figure 2-2. Hardware Items Used for Rigging Platform Loads (continued)**



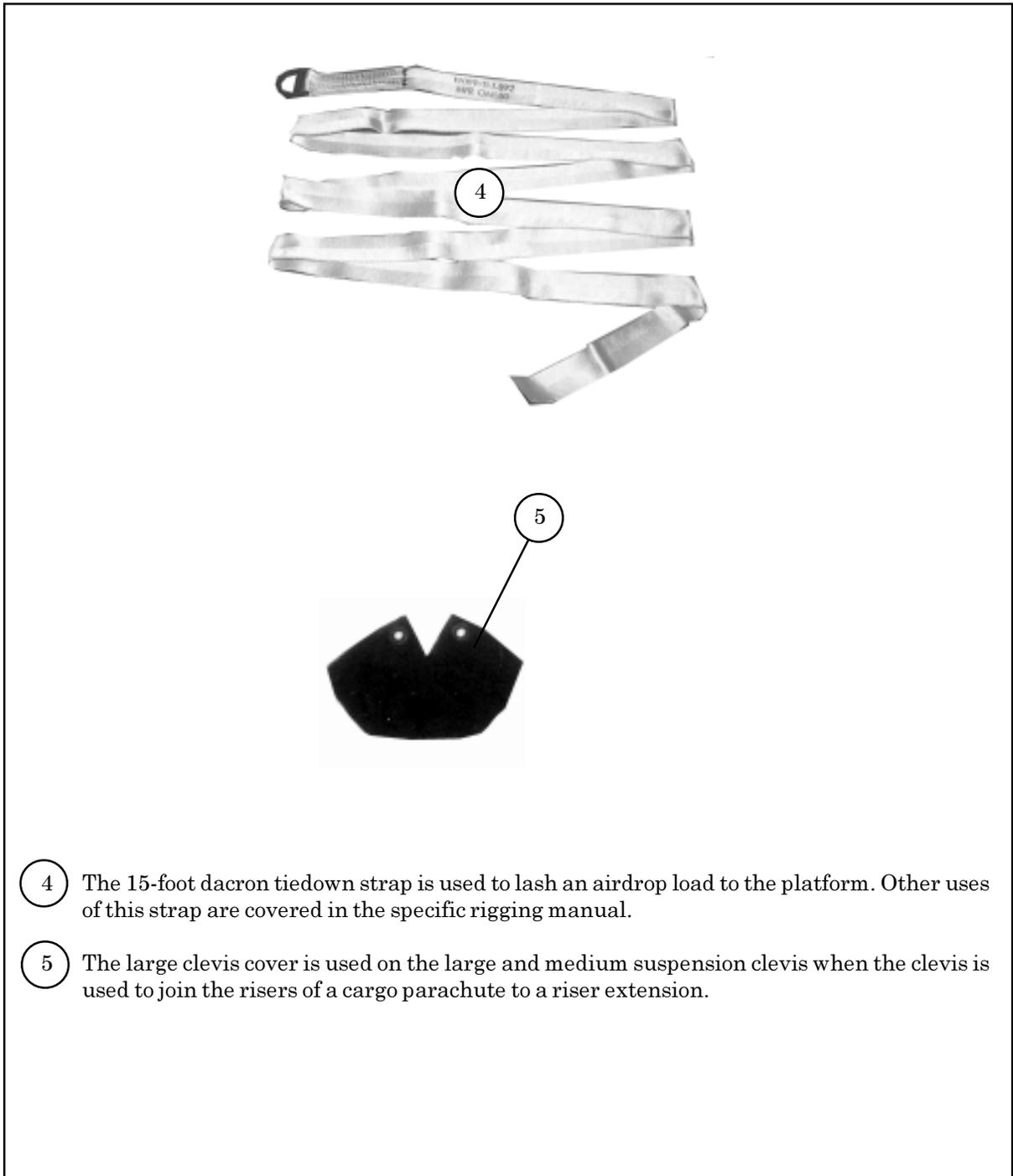
16 The EFTC 11-inch extraction coupler assembly (modified) is used to join six-loop extraction lines in the C-5 aircraft.

17 The EFTC actuator arm extension pin is used in the C-5 aircraft. The pin rides on top of the left rail.

**Figure 2-2. Hardware Items Used for Rigging Platform Loads (continued)**



**Figure 2-3. Straps and Canvas Items Used for Rigging Platform Loads**



- 4 The 15-foot dacron tiedown strap is used to lash an airdrop load to the platform. Other uses of this strap are covered in the specific rigging manual.
- 5 The large clevis cover is used on the large and medium suspension clevis when the clevis is used to join the risers of a cargo parachute to a riser extension.

**Figure 2-3. Straps and Canvas Items Used for Rigging Platform Loads (continued)**

Section III

## Suspension Slings

### CARGO SLINGS

2-5. Cargo slings (Figure 2-4) are used as suspension slings on platform loads rigged for low-velocity airdrop. These slings suspend the load under the cargo parachute during descent. Suspension slings connect the cargo parachute to the load using a parachute release assembly. Cargo slings may also be used as deployment lines and to extend the risers of cargo parachutes or to group the bridles of a multiparachute load.

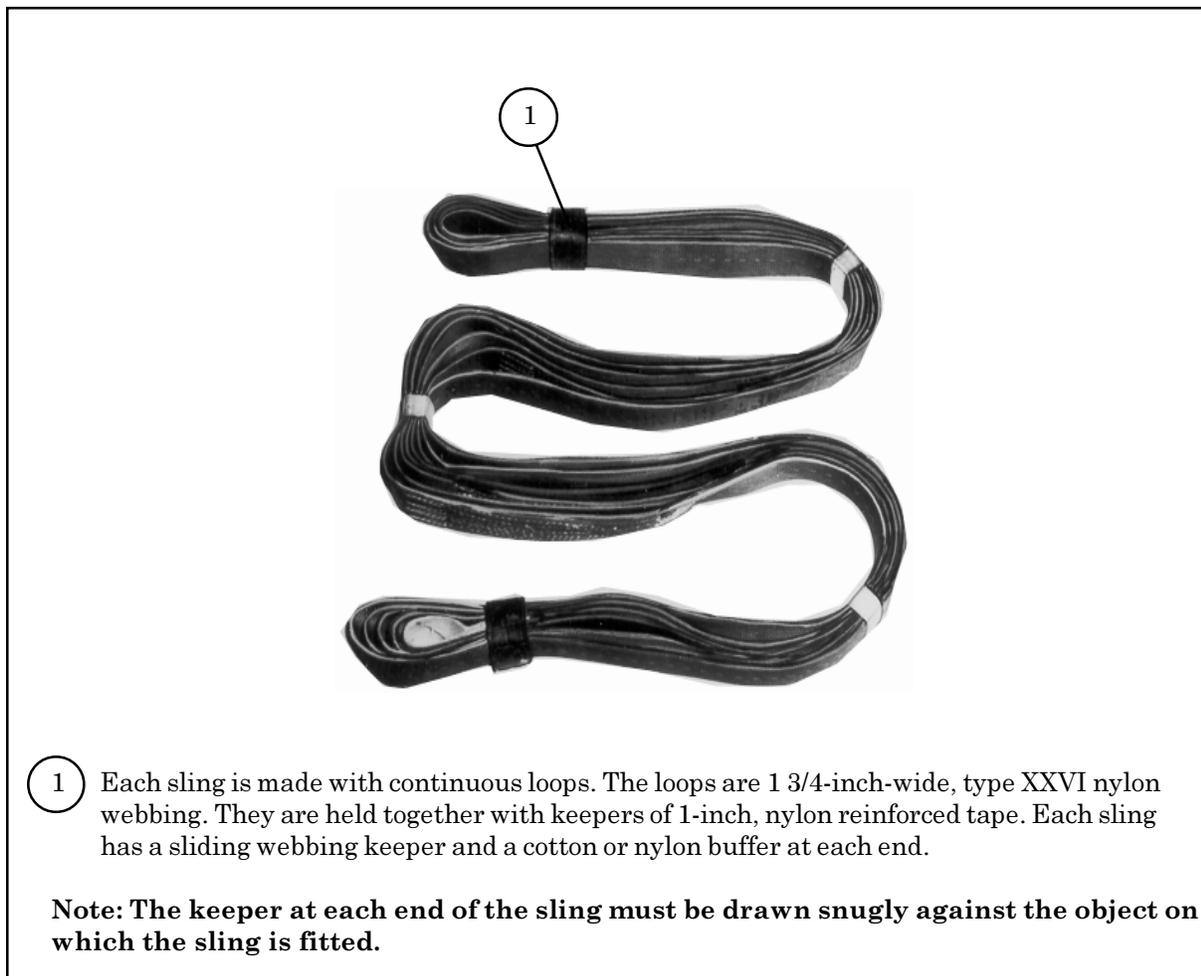


Figure 2-4. Cargo Slings

## REQUIREMENTS

2-6. The size and number of suspension slings needed to rig an airdrop platform load for low-velocity airdrop depend on the suspended weight of the load. The size and number of cargo slings needed at each suspension point are listed in Table 2-2. The types and lengths of suspension slings authorized for use when a platform load is rigged for low-velocity airdrop are listed in Table 2-3. Each specific rigging manual lists the slings used on a specific load.

**Table 2-2. Size and Number of Cargo Slings Required for Airdrop Platform Loads**

<p align="center"><b>Weight of Rigged Load Without Cargo Parachutes (pounds)</b></p>	<p align="center"><b>Type XXVI Nylon Webbing Cargo Slings at Each Suspension Point</b></p>
<p align="center">2270 to 14,000</p>	<p align="center">1 each (2-loop)</p>
<p align="center">14,001 to 40,000</p>	<p align="center">1 each (4-loop)</p>

Table 2-3. Suspension Slings for Low-Velocity Airdrop

National Stock Number	Length (feet)	Number of Loops	Type of Nylon Webbing
1670-01-062-6301	3	2	XXVI
1670-01-062-6306	3	4	XXVI
1670-01-062-6304	9	2	XXVI
1670-01-062-6305	9	4	XXVI
1670-01-063-7760	11	2	XXVI
1670-01-062-6310	11	4	XXVI
1670-01-062-6303	12	2	XXVI
1670-01-062-6307	12	4	XXVI
1670-01-063-7761	16	2	XXVI
1670-01-062-6308	16	4	XXVI
1670-01-062-6302	20	2	XXVI
1670-01-064-4453	20	4	XXVI

Section IV

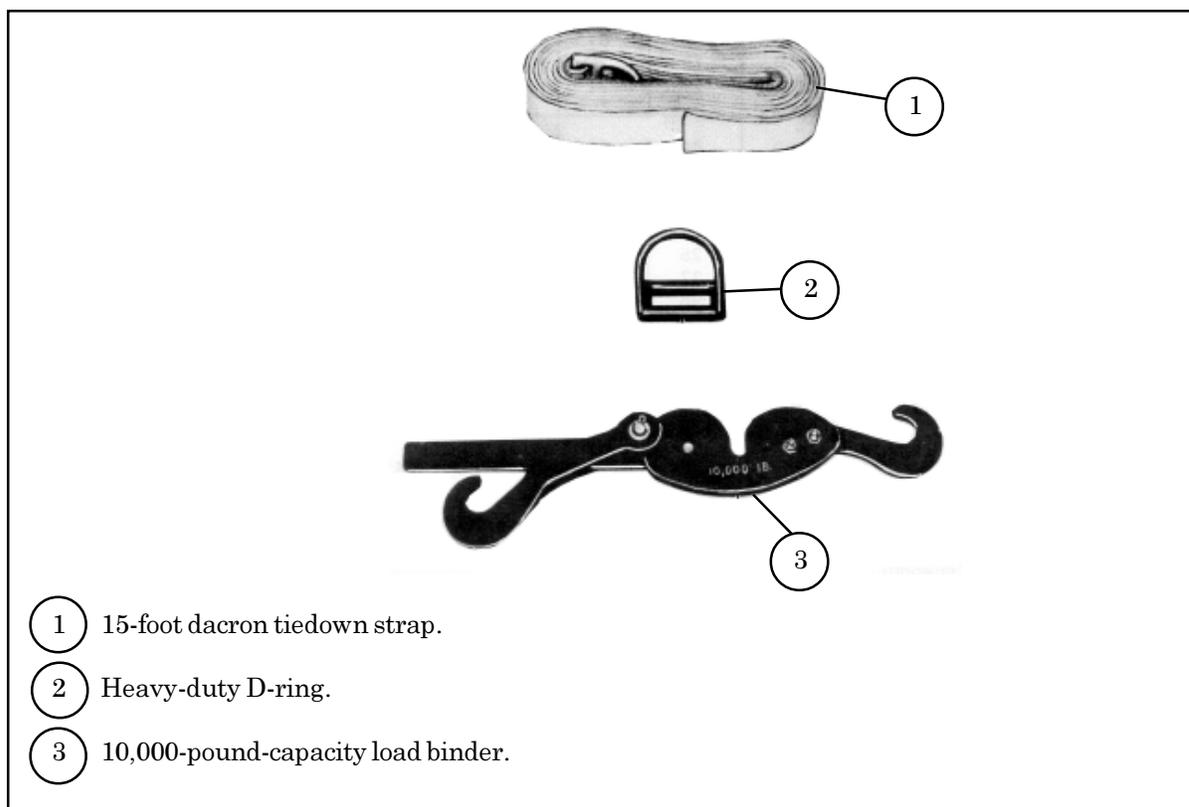
**Lashings**

**USE**

2-7. The drop item and the accompanying load are lashed to the platform to prevent damage to the load or to the aircraft during airdrop. The accompanying load is lashed to the platform to withstand the same force as the drop item.

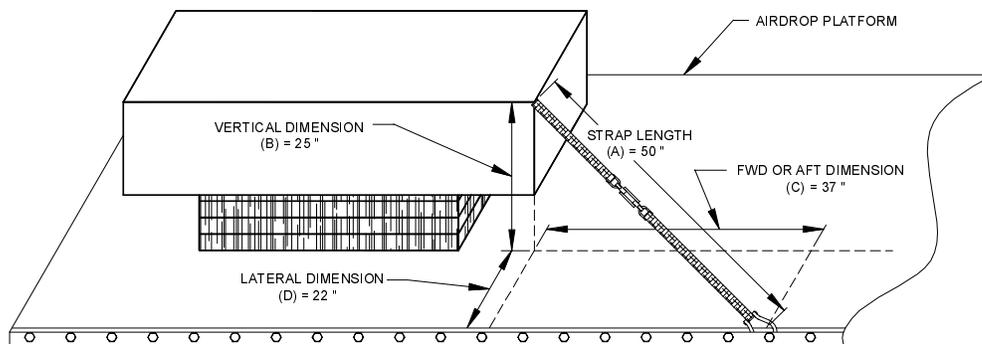
**COMPONENTS AND STRENGTHS**

2-8. The components of the lashings used on airdrop loads are shown in Figure 2-5. The effective strength of a lashing is determined by the angle of lashing to the plane of thrust. Table 2-4 illustrates a method of determining lashing effectiveness forward, aft, lateral, and vertical thrusts. The maximum strengths of the various forms of lashings are given in Figure 2-6.



**Figure 2-5. Components of a Tiedown Assembly**

Table 2-4. Lashing Effectiveness



THIS FIGURE ILLUSTRATES A METHOD OF DETERMINING RESTRAINT PROVIDED BY A GIVEN AIRDROP TIEDOWN. AS ILLUSTRATED, TIEDOWN RATIOS CAN BE DETERMINED BY DIVIDING THE DIRECTIONAL DISTANCE IN WHICH RESTRAINT IS REQUIRED BY THE STRAP LENGTH. THIS RATIO IS THEN MULTIPLIED BY THE STRENGTH OF THE TIEDOWN STRAP OR ATTACHMENT POINT, WHICHEVER IS LESS, TO FIND THE EFFECTIVE RESTRAINT RECEIVED FROM THE TIEDOWN PATTERN USED.

**EXAMPLE:** (Note: Quantities used are from the example above)

- 1) FIRST, MEASURE THE TIEDOWN STRAP LENGTH (A) FROM THE ATTACHMENT POINT ON THE AIRDROP LOAD TO THE TIEDOWN FITTING ON THE AIRDROP PLATFORM (50 INCHES). YOU WILL USE THIS MEASUREMENT IN EACH CALCULATION.
- 2) **CALCULATING THE VERTICAL RESTRAINT:**
  - a) FOR DETERMINING VERTICAL RESTRAINT, MEASURE THE VERTICAL DIMENSION (B) FROM THE ATTACHMENT POINT ON THE AIRDROP LOAD TO A POINT DIRECTLY BENEATH IT ON THE AIRDROP PLATFORM SURFACE (25 INCHES).
  - b) DIVIDE THE VERTICAL DIMENSION (B) BY THE TIEDOWN STRAP LENGTH (A) TO DETERMINE A RATIO:  

$$\frac{25}{50} = 0.50 \text{ RATIO}$$
  - c) MULTIPLY THIS RATIO BY THE RATED STRENGTH OF THE TIEDOWN STRAP OR THE RATED STRENGTH OF THE TIEDOWN FITTING ON THE LOAD OR ON THE PLATFORM, WHICHEVER IS LESS:  

$$0.50 \times 10,000^* = 5,000 \text{ POUNDS}$$
← **VERTICAL RESTRAINT RECEIVED FROM STRAP**
- 3) **CALCULATING THE FORWARD OR AFT RESTRAINT:**
  - a) FOR DETERMINING FORWARD OR AFT RESTRAINT, OBTAIN A FORWARD OR AFT DIMENSION (C) BY MEASURING FROM A POINT DIRECTLY BENEATH THE ATTACHMENT POINT ON THE AIRDROP LOAD ALONG A LONGITUDINAL AXIS TO A POINT LATERAL TO THE TIEDOWN FITTING BEING USED ON THE AIRDROP PLATFORM (37 INCHES).
  - b) DIVIDE THE FORWARD OR AFT DIMENSION (C) BY THE TIEDOWN STRAP LENGTH (A) TO DETERMINE A RATIO:  

$$\frac{37}{50} = 0.74 \text{ RATIO}$$
  - c) MULTIPLY THIS RATIO BY THE RATED STRENGTH OF THE TIEDOWN STRAP OR PLATFORM SIDERAIL TIEDOWN CLEVIS, 10,000 OR TYPE V PLATFORM PANEL TIEDOWN RING, 4,000, WHICHEVER IS LESS:  

$$0.74 \times 10,000^* = 7,400 \text{ POUNDS}$$
← **FWD OR AFT RESTRAINT RECEIVED FROM STRAP**

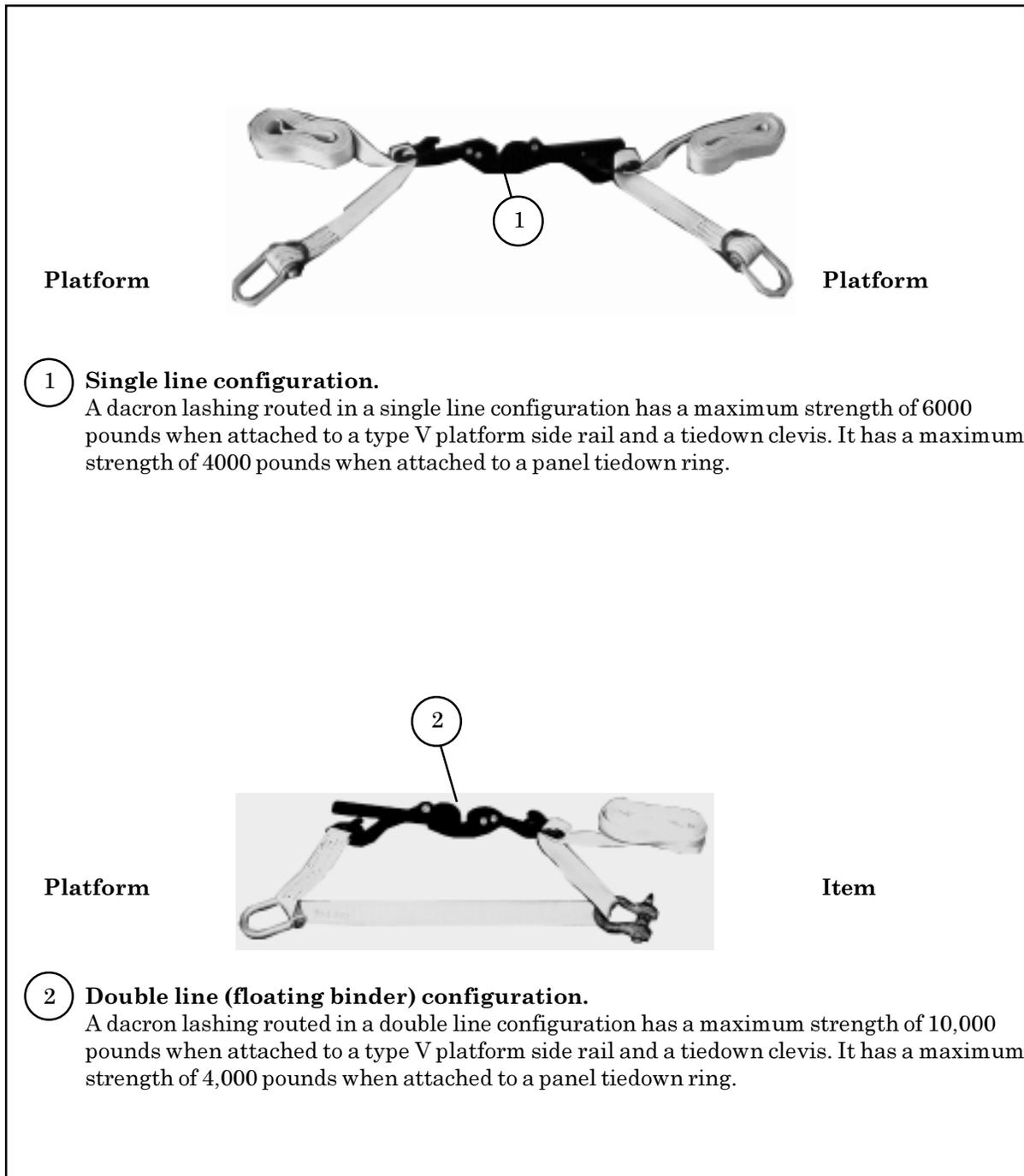


Figure 2-6. Strengths of Dacron Lashings

## Section V

# Cargo Parachutes

## USE

2-9. Cargo parachutes, also called recovery parachutes, are used to slow the descent of a low-velocity platform load. Table 2-5 lists the weight limitations for cargo parachutes used with airdrop platform loads.

## TYPES

2-10. The following cargo parachutes are used when loads are rigged for low-velocity airdrop.

**a. G-11B Cargo Parachute.** The parachute has a 100-foot-diameter canopy. It has 120 suspension lines (35-foot, type III nylon cord). The apex vent lines have been pulled down with a type V nylon webbing center line. The parachute has four 2-second cutters. When packed, the assembly weighs 250 pounds.

**b. G-11C Cargo Parachute.** This is the same parachute as the G-11B except this parachute has two 2-second cutters with two reusable reefing lines.

**c. G-12E Cargo Parachute.** This parachute has a 64-foot-diameter canopy. It has sixty-four 51-foot, type IV braided nylon cord suspension lines. The bridle loop has been pulled down with a type V nylon webbing center line. When packed, the assembly weighs 125 pounds.

Table 2-5. General Weight Limitations for Cargo Parachutes

**\*Suspended Weight in Pounds**

Parachutes	Minimum	Maximum
<b>G-11B</b>		
1	2,270	5,000
2	5,001	10,000
3	10,001	15,000
4	15,001	20,000
<b>G-11C</b>		
5	20,001	25,000
6	25,001	30,000
7	30,001	35,000
8	35,001	40,000
<b>G-12E*</b>		
1	501	2200
2	2,270	3,500

\* Suspended weight in pounds is the total rigged weight less the weight of the cargo parachutes.

## RISER EXTENSIONS

2-11. Cargo parachutes are used singularly or in a cluster. When parachutes are used in a cluster, the risers of each parachute are lengthened so the canopies remain almost vertical as they descend to increase the effectiveness of each canopy. The length of a riser extension and the number of stows used in stowing the extensions are given in Table 2-6.

**Table 2-6. Riser Requirements for G-11B, G-11C, and G-12E Cargo Parachute Clusters**

<b>Number of Parachutes in Cluster</b>	<b>Length of Riser Extension (feet)</b>	<b>Number of Extension Stows</b>	<b>Type XXVI Nylon Webbing Slings</b>
2	20	2	20-foot (2-loop)
3 or 4	60	8	60-foot (3-loop)
5 to 8	120	16	120-foot (2-loop)

**Notes:**

1. All riser extensions must be continuous type XXVI nylon slings and have identical riser extensions and each must be of the same length.
2. For proper stowing procedures for G-11B, G-11C, and G-12E, see Chapter 3.
3. G-12E has three stows.

## Section VI

## Parachute Restraint System

## USE

2-12. A parachute restraint system, consisting of one to three restraint straps and one or more parachute release straps, is used on all airdrop platform loads rigged with two or more cargo parachutes. Installation procedures are the same for the G-11B and G-11C, or G-12E cargo parachutes.

## DESCRIPTION

2-13. When the force is transferred from the extraction parachute to the deployment line, it pulls on the clevis to which the release strap is secured. This pulls the knife on the release strap to cut the restraint strap and allows the cargo parachutes to deploy. Parachute restraint straps are made from lengths of one of the types of webbing shown in Figure 2-7.

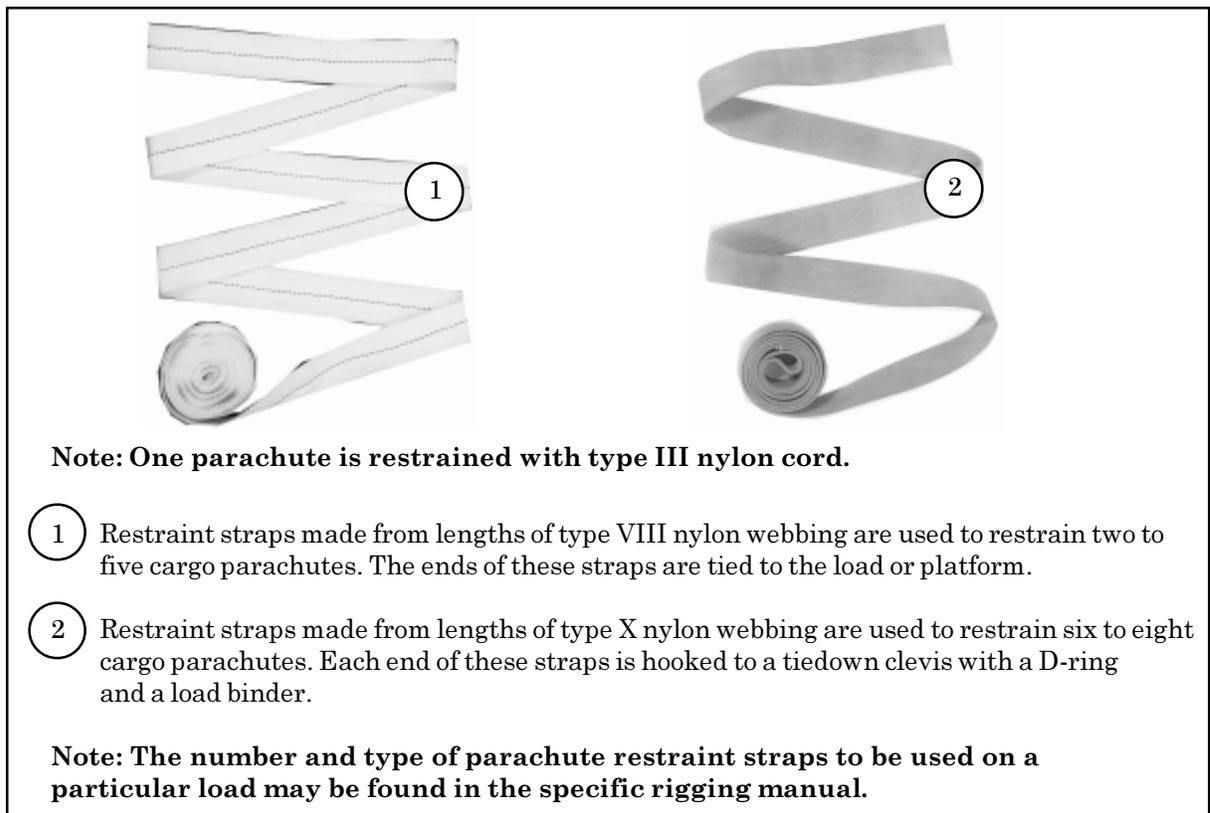


Figure 2-7. Webbing Used for Parachute Restraint Straps

Section VII

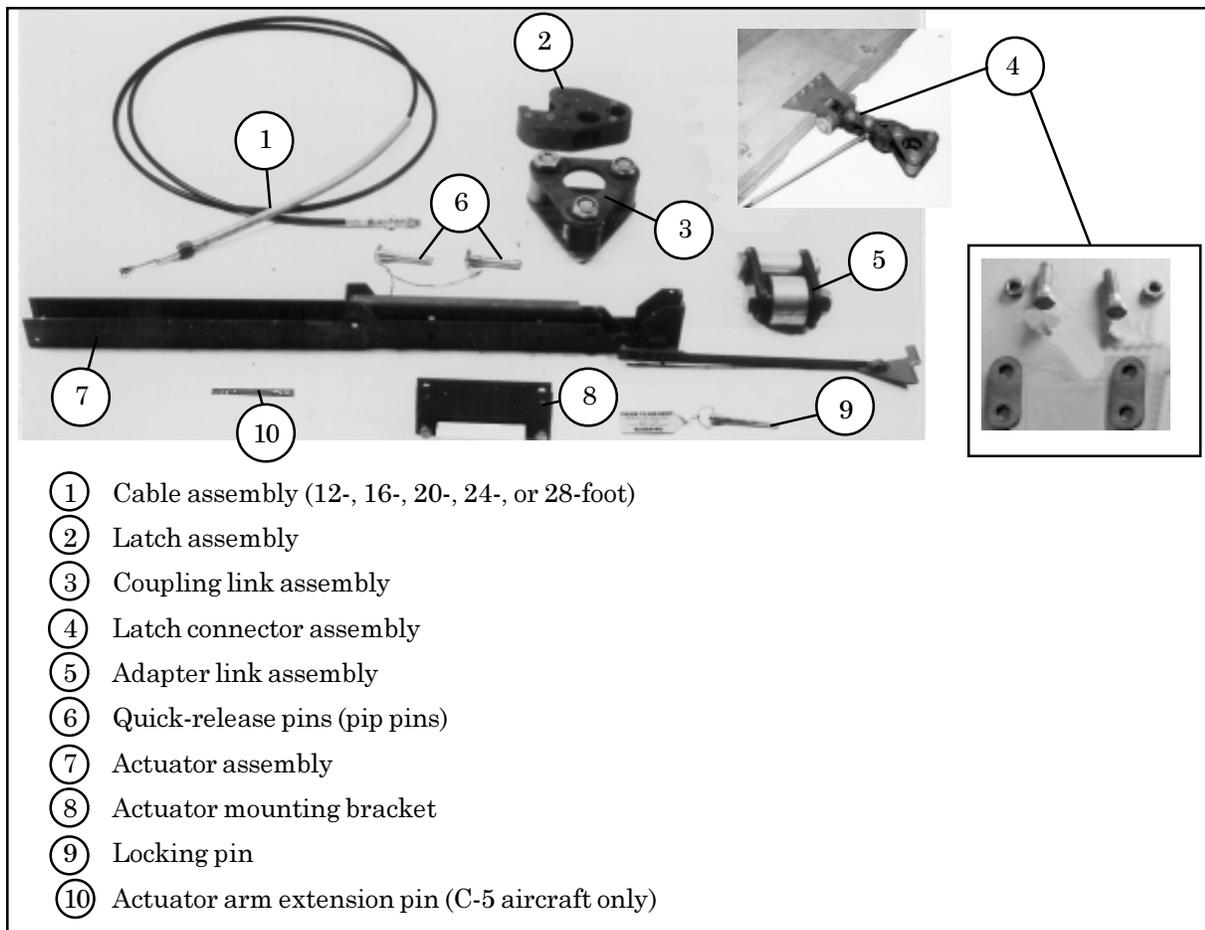
**Extraction System**

**USE**

2-14. The extraction system is made up of the extraction parachute, the extraction lines and the Extraction Force Transfer Coupling (EFTC). The system is bolted to the airdrop platform and is used to pull the load from the aircraft. For airdrop, the load exits through the cargo ramp and door of the aircraft. The extraction force is then transferred to the deployment line of the cargo parachute.

**COMPONENTS**

2-15. The components of the EFTC used on low-velocity airdrop loads are shown in Figure 2-8.



**Figure 2-8. Components of EFTC**

## OPERATION

2-16. The EFTC is used for low-velocity airdrop and how it operates is described below.

**a.** After the extraction parachute has deployed, it pulls on the coupling link assembly or the adapter link assembly (Items 3 and 5, Figure 2-8) and pulls the load from the aircraft.

**b.** The arm of the actuator assembly (Item 7, Figure 2-8) rides on top of the rail. In the C-5 aircraft the actuator arm extension pin rides on top of the left rail in the aircraft. When the actuator has been pulled clear of the rails, the arm of the actuator rotates downward and pulls on the cable (Item 1, Figure 2-8) hooked to the catch inside the latch assembly (Item 2, Figure 2-8). This causes the catch to release the coupling link assembly.

**c.** The extraction parachute then pulls on the deployment line which, in turn, breaks or cuts the parachute restraint. The extraction force then deploys the recovery parachute(s).

## Section VIII

# Release Assemblies

## USE

2-17. The cargo parachute release assembly separates the parachute (s) from the load when the load touches the ground. The separation reduces the chance of the wind dragging or overturning the load.

## DESCRIPTION

2-18. The M-1 or the M-2 is used when a platform load is rigged for low-velocity airdrop. The automatic cargo release is used on some Navy and Air Force loads.

*a. The M-1 Airdrop Cargo Parachute Release.* This release is used with rigged loads weighing up to 15,000 pounds suspended.

*b. The M-2 Airdrop Cargo Parachute Release.* The M-2 release is similar to the M-1 release. The M-2 release is used on loads weighing up to 42,000 pounds suspended.

*c. The Automatic Cargo Release (Not for Army Use).* The automatic cargo release is a two-piece unit that operates on a load-tension activated hydraulic arming delay principal. It has no internal maintenance or repair. The automatic cargo release is used on loads weighing up to 2,500 pounds suspended. The complete description of the automatic cargo release is in Chapter 3, Section VI.

**Note: Specific rigging manuals will specify which release is used.**

## INSPECTION AND MAINTENANCE

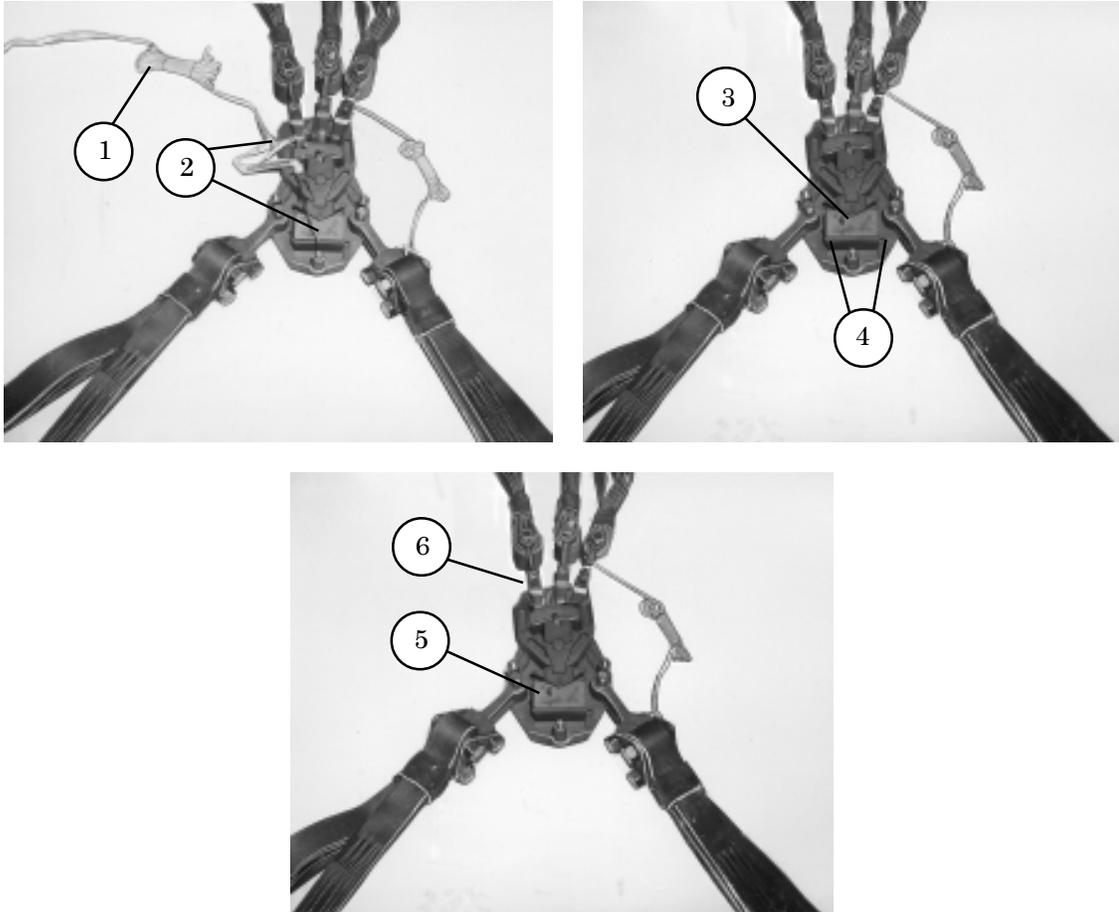
2-19. The M-1 and M-2 releases are inspected and maintained as outlined in TM 10-1670-296-20&P/TO 13C7-49-2. See the TM for specifics on inspection and maintenance.

## OPERATION

2-20. The operation of the airdrop cargo parachute release is given below.

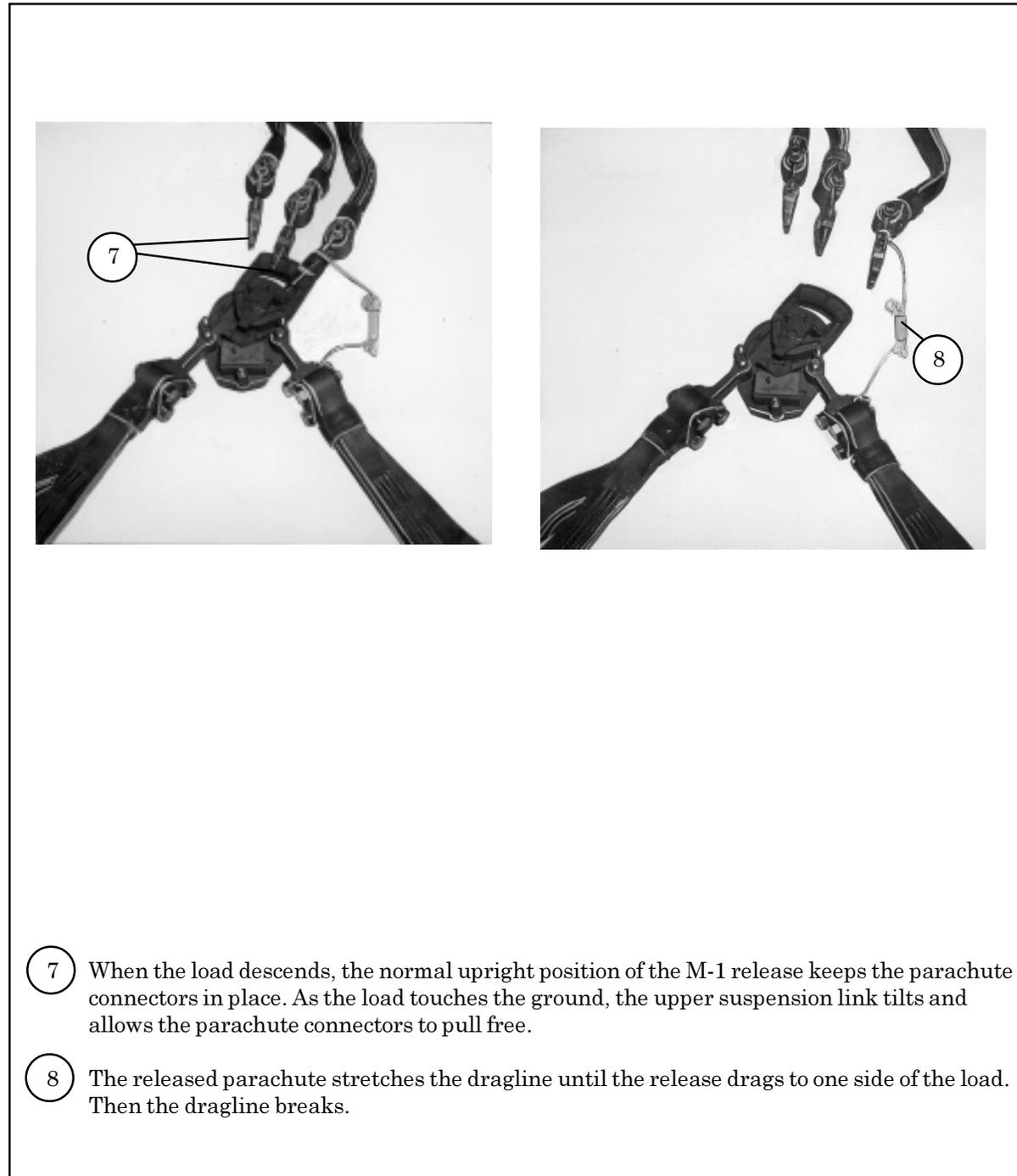
*The Airdrop Cargo Parachute Release.* The release works when the load touches the ground and upper suspension link tilts or moves to the side. When the release tilts, the parachutes are released from the load. Figure 2-9 shows how the release operates.

**Note: The face plate has been removed to aid in identification.**



- ① As the cargo parachute deploys, the arming wire lanyard is pulled.
- ② The safety tie is broken and the arming wire is pulled from the timer.
- ③ The timer delays from 12 to 16 seconds. This delay allows the load to stabilize itself under the parachute.
- ④ When the timer winds down, it retracts its keys from the slots in the release.
- ⑤ When the keys are retracted from their slots, the timer is free to fall within the release.
- ⑥ As the timer falls, it frees the toggle and upper suspension link.

**Figure 2-9. Typical Operation of the M1 and M2 Cargo Parachute Release**



**Figure 2-9. Typical Operation of the M1 and M2 Cargo Parachute Release (Continued)**

## Section IX

# Extraction Parachutes And Extraction Line

## CARGO EXTRACTION PARACHUTES

2-21. A cargo extraction parachute is placed on every airdrop platform load to pull the load out of the aircraft. The extraction system is rigged up by Air Force personnel after the load is in the aircraft.

*a. The 15-Foot Parachute.* This extraction parachute has a 15-foot-diameter, flat circular ring-slot nylon canopy. It is also used as a drogue parachute.

*b. The 22-Foot Parachute.* This extraction parachute has a 22-foot-diameter, flat circular ring-slot nylon canopy.

*c. The 28-Foot Parachute.* This extraction parachute has a 28-foot-diameter, flat circular, ring-slot nylon canopy.

## INSPECTION, MAINTENANCE, AND PACKING

2-22. Cargo extraction parachutes are inspected, maintained, and packed as outlined in TM 10-1670/TO 13C5 series manuals. See the specific TM for more information on inspecting, maintaining, and packing these parachutes. The 22-foot extraction deployment bag modification procedures are located in TM 10-1670-286-20.

## REQUIREMENTS

2-23. Every rigging manual states the number and type of cargo extraction parachutes and the extraction line to be used on a particular load. However, when changes are made to an accompanying load or variations in rigging are made, the extraction parachute requirement must be determined.

*a. Low Velocity Airdrop.* Use Table 2-7 as a guide for determining the cargo extraction parachute. Use Table 2-8 as a guide for determining extraction line requirements for the C-130, C-141, and C-17 aircraft. Use Table 2-9 for determining extraction line requirements for the C-5 aircraft. Table 2-10 shows the MC-130 aircraft extraction drogue parachute and extraction drogue line requirements.

**Table 2-7. Extraction Parachute Requirements for C-130, C-141, C-17, and C-5 Aircraft**

Extraction Load Range	Cargo Extraction Parachute
2,520-8,000	15-Foot
7,000-17,500	22-Foot
16,000-30,000	28-Foot
28,000-42,000	Two 28-Foot

**Notes:**

1. **The maximum load that may be extracted over the ramp of a C-130 aircraft during airdrop is 25,000 pounds for aircraft with a serial number (tail number) of 62-1783 or lower and 42,000 pounds for aircraft with a tail number of 61-2358, 62-1784 and higher.**
2. **The maximum load extracted over the ramp of a C-141 is 38,500 pounds. During contingency (wartime), with Air Force Major Command (MAJCOM) approval, the maximum platform weight may be increased to 42,000 pounds.**
3. **When the extraction weight falls into the load range of two parachutes, the larger extraction parachute should be used.**
4. **The minimum total rigged weight (includes the weight of the cargo parachutes) for loads to be airdropped from all aircraft is 2,520 pounds.**

**Table 2-8. Extraction Line Requirements for C-130, C-141, and C-17 Aircraft**

<b>Extraction Parachute</b>	<b>C-130</b>	<b>C-141</b>	<b>C-17</b>
15-Foot	1-Loop 60-Foot	1-Loop 160-Foot	1-Loop 160-Foot
22-Foot	3-Loop 60-Foot	3-Loop 140-Foot	3-Loop 140-Foot
28-Foot	3-Loop 60-Foot	3-Loop 140-Foot	3-Loop 140-Foot
Two 28-Foot	6-Loop 60-Foot	6-Loop 120-Feet	6-Loop 140-Foot Note 3

**Notes:**

- 1. All extraction lines, except for the C-17 drogue line must be packed in an extraction line bag according to TM 10-1670-286-20/TO 13C5-2-41.**
- 2. A 15-foot extraction parachute is used as a drogue with a 1-loop 60-foot type XXVI extraction line used as a drogue line.**
- 3. A 120-foot extraction line may be used for loads placed no further forward than fuselage station 680 (C-17 only).**
- 4. All extraction lines are type XXVI nylon webbing.**

Table 2-9. Extraction Line Requirements for C-5 Aircraft

Extraction Parachute	Fuselage Station	Extraction Line
15-Foot	1187-1971	1-Loop 160-Foot
22-Foot	1427-1971	3-Loop 140-Foot
22-Foot	707-1426	3-Loop 140-Foot+3-Loop 60-Foot
28-Foot	1427-1971	3-Loop 140-Foot
28-Foot	707-1426	3-Loop 140-Foot+3-Loop 60-Foot
Two 28-Foot	1667-1971	6-Loop 120-Foot
Two 28-Foot	947-1666	6-Loop 120-Foot+6-Loop 60-Foot
Two 28-Foot	574-947	6-Loop 120-Foot+6-Loop 120 Foot

**Notes:**

1. The length of the extraction line will be determined upon positioning the load in the aircraft.
2. When connecting extraction lines, the shortest line will be attached to the extraction parachute (s).
3. The most forward fuselage station on which the aft edge of the airdrop platform shall be positioned is based on the length of the extraction line. The above limitations shall not be exceeded. The actuator arm of the EFTC must not be positioned forward of fuselage station 574.

**b. Low Velocity Airdrop Using the Towplate from the MC-130 Aircraft.** Use Table 2-10 as a guide for determining the extraction/drogue parachute and extraction/drogue line needed for low-velocity platform airdrop from tow plate equipped C-130/MC-130 aircraft. See Table 2-11 for the link and tie requirements to connect the 15-foot drogue parachute to the drogue extraction line.

**Table 2-10. Extraction/Drogue Parachute and Extraction/Drogue Line Requirements for Low-Velocity Airdrop using the Towplate from the MC-130 Aircraft**

Extracted Load Range (pounds)	Main Extraction Parachute	Main Extraction Line	Drogue Parachute	Drogue Line
2,520-8,000 (4)	15-ft	1-loop, type XXVI, 60-ft	15-ft	1-loop, type XXVI, 60-ft
7,000-17,500 (2,4)	22-ft	3-loop, type XXVI, 60-ft	15-ft	1-loop, type XXVI, 60-ft
16,000-30,000 (2,4)	28-ft	3-loop, type XXVI, 60-ft	15-ft	1-loop, type XXVI, 60-ft
28,000-35,000 (3)	Two 28-ft	6-loop, type XXVI, 60-ft	15-ft	1-loop, type XXVI, 60-ft

**Notes:**

1. When the extracted weight falls into the load range of two parachutes, the larger extraction parachute should be used.
2. The 22-foot and 28-foot extraction parachute and the 3-loop, type XXVI, 60-foot extraction line will be rigged according to TM 10-1670-286-20/TO 13C5-2-41.
3. Two 28-foot main extraction parachutes and the 6-loop, type XXVI, 60-foot extraction line will be rigged according to TM 10-1670-286-20/TO 13C5-2-41.
4. All extraction lines and drogue extraction lines except the drogue lines used in the C-17 must be in line bags in accordance with TM 10-1670-286-20/TO 13C5-2-41

Table 2-11. Link and Tie Requirements for Parachutes

**C-130, C-141, and C-5 Aircrafts**

Parachute	Link	Tie
15-foot	3 3/4-inch, two-point	1 turn single of type I, 1/4-inch cotton webbing
22-foot	3 3/4-inch, two-point	1 turn single of type I, 1/4-inch cotton webbing
One 28-foot	5 1/2-inch, two point	1 turn double of type I, 1/4-inch cotton webbing
Two 28-foot	Four-point	1 turn single of type III nylon cord

Table 2-11. Link and Tie Requirements for Parachutes (Continued)

**C-17 Aircraft**

Parachute	Link	Tie
*15-foot drogue	3 3/4-inch, two-point	1 turn single of type I, 1/4-inch cotton webbing
15-foot extraction	3 3/4-inch, two-point	1 turn single of 1/2-inch tubular nylon <b>Note: When used in sequential airdrop, safety tie the two-point link with type III nylon cord.</b>
22-foot extraction	3 3/4-inch, two-point	1 turn single of type III nylon cord
28-foot extraction	5 1/2-inch, two-point	1 turn single of type III nylon cord
Two 28-foot extraction	four-point	1 turn single of 1/2-inch tubular nylon

\* The bag closing ties for the 15-foot drogue parachute with a 60-foot 1-loop drogue line will be one turn double ticket number 5 cord. A 3 3/4-inch, two-point link is used to connect the drogue line to the drogue parachute. Use one turn single, 1/4-inch cotton webbing to secure the link to the drogue parachute. Pass the 1/4-inch cotton webbing through the link and the top and bottom bag closing loops on the grommet side of the bag and secure with a surgeon's knot and locking knot.

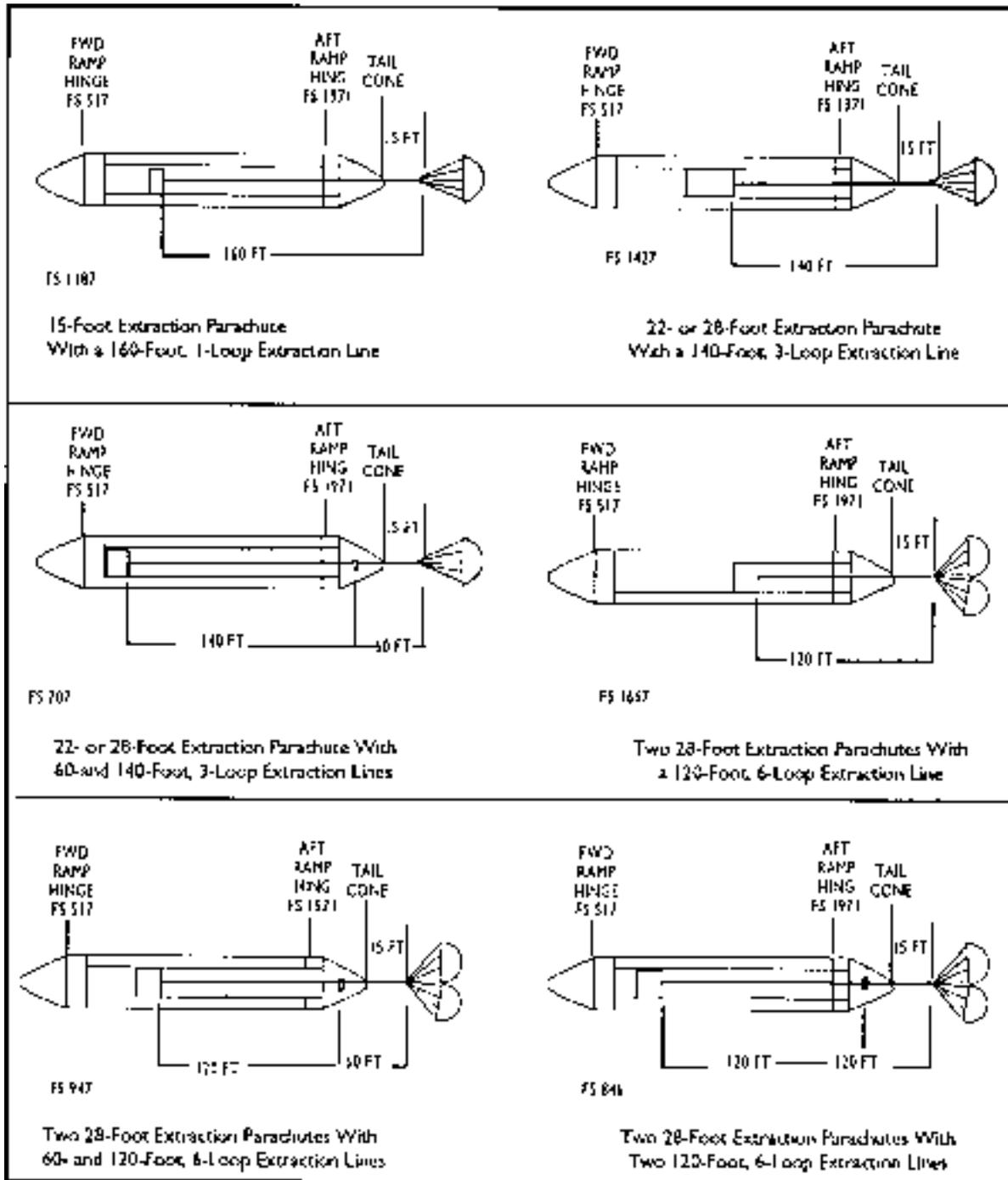


Figure 2-10. C-5 Aircraft Extraction Parachute and Extraction Line Requirements

## EXTRACTION LINE PANEL

2-24. The extraction line panel, as shown in Figures 2-11 and 2-12, is used to store the extraction lines. Extraction line panels shown in Figure 2-13 are used to store the extraction lines when used in conjunction with towplate operations. Stow the different extraction lines in the extraction line bag according to TM 10-1670-286-20/TO 13C5-2-41.

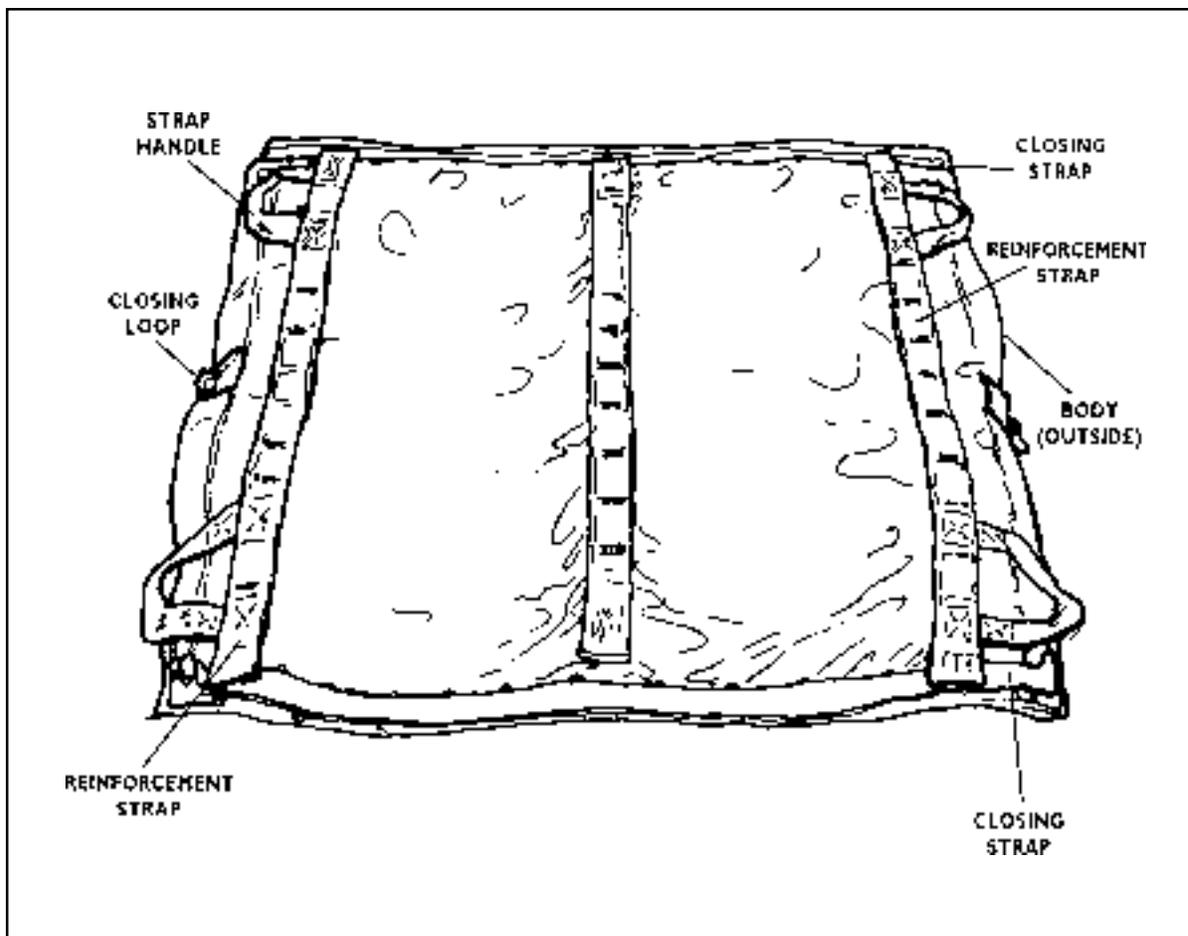


Figure 2-11. Outside View of Extraction Line Panel

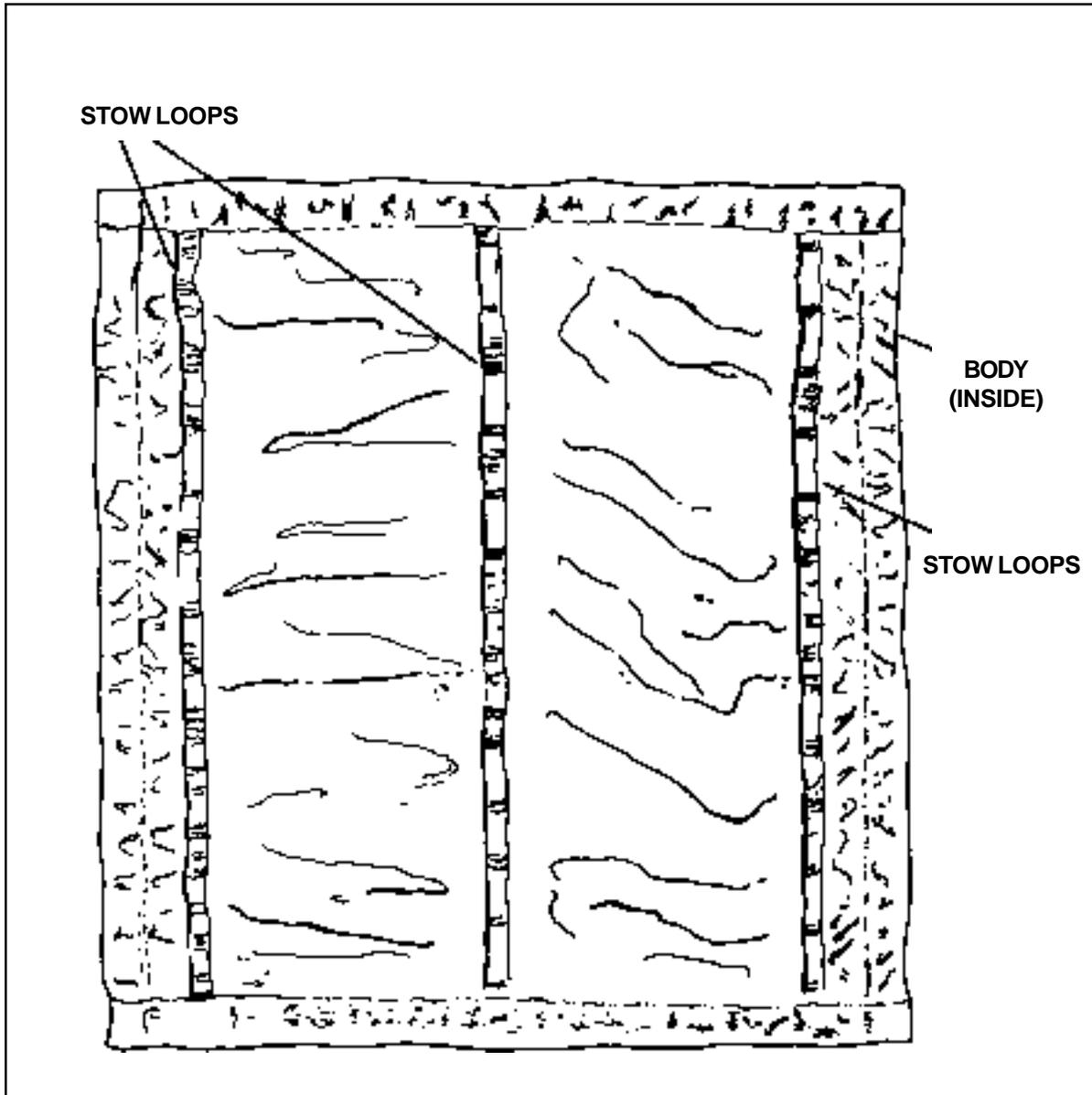


Figure 2-12. Inside View of Extraction Line Panel

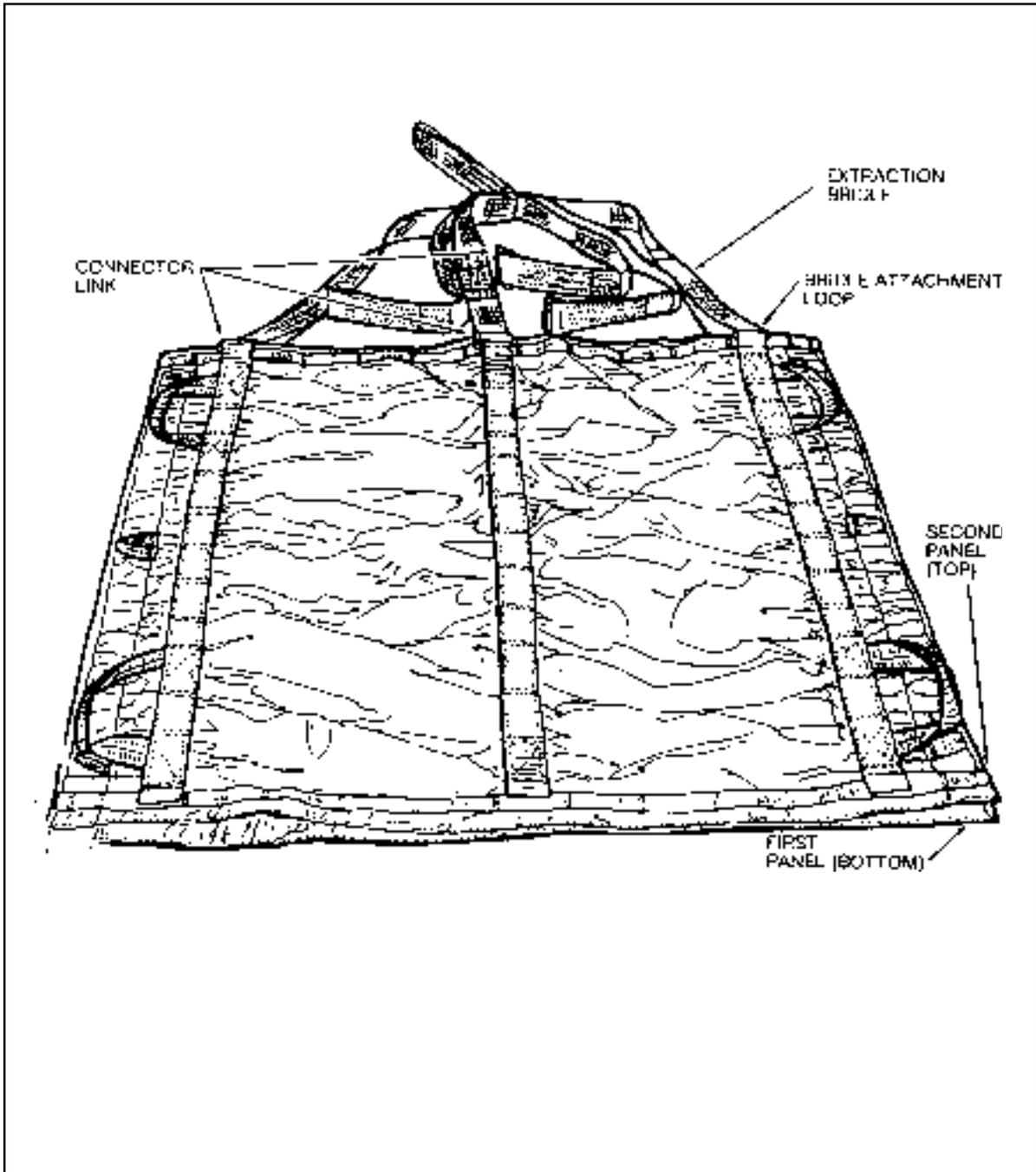


Figure 2-13. Extraction Line Panel for Tow Plate Operations

## Section X

# Transportation of Rigged Loads

## RESPONSIBILITIES

2-25. The using unit is responsible for coordinating transportation of the rigged load from the rigging site to the aircraft. To prevent damage, loads must be lashed to the transporting vehicle and protected during transport. The transporting force must ensure that the off-loading equipment is compatible with the aircraft to be used.

## TYPICAL LOADING AND TRANSPORTING EQUIPMENT

2-26. Some of the equipment that may be used to load and transport rigged loads is listed below.

**a. *Materials-Handling Equipment.*** If a loading ramp is not available to use in loading the rigged load onto the transporting vehicle, the load is hoisted aboard the vehicle. The materials-handling equipment used to hoist the loads may include but not limited to the 5-ton wrecker, the 10,000- or 15,000-pound-capacity warehouse crane, or the 15,000-pound-capacity forklift truck.

**b. *Transporting Vehicle.*** Any standard military truck or semitrailer with sufficient cargo space and payload capacity can be modified to transport a rigged load from the loading area to the cargo aircraft. However, not all military trucks are compatible with the cargo-loading system of all types of cargo aircraft now in use. Rigged platform loads require straight-in loading over a horizontally positioned ramp from a truck, a forklift, a flatbed, or a cargo loader. Consequently, this may require transfer of the rigged load at the aircraft site before it is off-loaded into the cargo aircraft. The following types of materials-handling equipment can be used to transport and/or off-load platform loads:

(1) The 6- or 10-ton cargo semitrailer can transport loads rigged on airdrop platforms.

(2) The 25,000-pound-capacity cargo loader can move the maximum weight of 25,000 pounds up a 3-percent incline at 15 miles per hour. It can be used for loading all aircraft.

(3) The 40,000-pound-capacity cargo loader can move the maximum weight of 40,000 pounds up a 3-percent incline at 15 miles per hour.

(4) The 60,000-pound-capacity cargo loader (the Tunner) can move the maximum weight of 60,000 pounds up a 3-percent incline at 15 miles per hour.

(5) The model M172 (lowboy) semitrailer can load C-130 and C-141 aircraft. Any similar vehicle can be used if its loading floor meets the cargo floor heights of the aircraft. For C-130 aircraft, this is 39 to 42 inches. For C-141 aircraft, this is 48 to 52 inches.

## Chapter 3

# Procedural Information

### Section I

## Platform And Honeycomb Preparation

### INSPECTING PLATFORM

3-1. The platform must be inspected as outlined below.

*Type V Platform.* Inspect, or assemble and inspect, the type V airdrop platform as outlined in TM 10-1670-268-20&P/TO 13C7-52-22.

### SUSPENDING PLATFORM LOADS

3-2. Platform loads must be suspended as outlined below.

*Type V Platform.* The suspension points for a platform-suspended load on a type V platform are the suspension bracket assembly holes. The emergency aft restraint holes are provided in the tandem link only. The suspension bracket assembly as shown in Figure 3-1, can be positioned at various points along a platform rail.

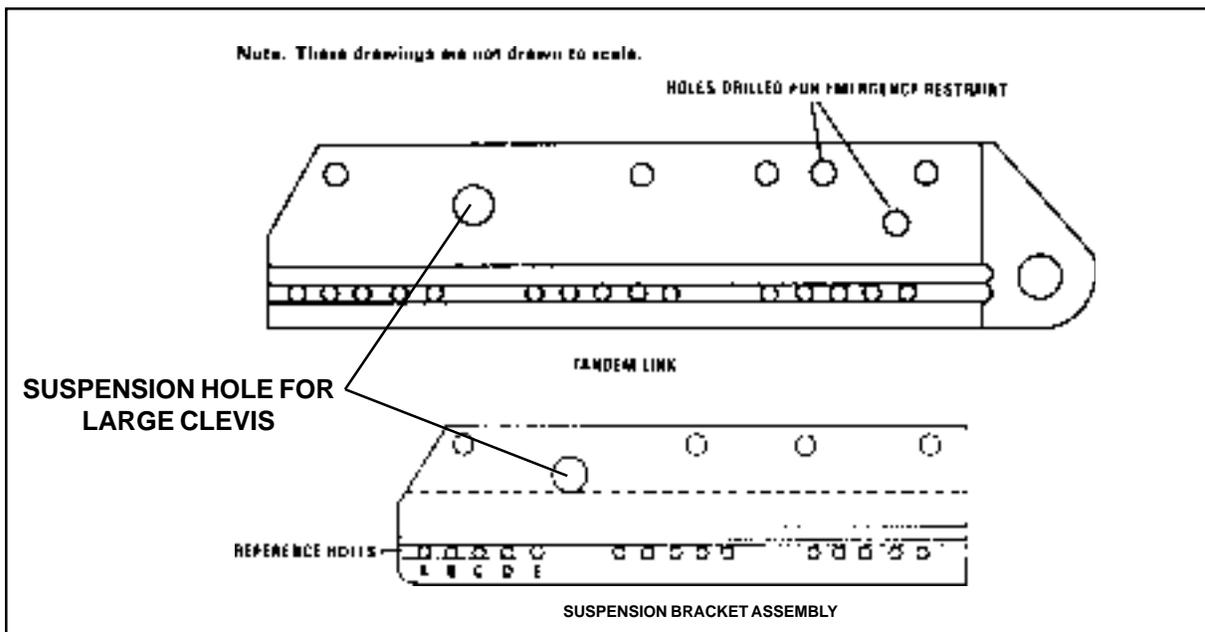


Figure 3-1. Tandem Link and Suspension Bracket Assembly

However, their positioning is limited by the fact that the bolt hole configuration of the platform side rails only allows the suspension bracket assembly to be secured within the 2-foot panels of the platform. Every panel assembly has a four-bolt configuration on each side. These four bolts are designated as platform clevis points. The suspension bracket assembly can be positioned within the bolt configuration of a panel as shown in Figure 3-2. A reference hole "B" is used to show the appropriate position of the suspension bracket assembly as shown in Figures 3-1 and 3-2. The direction of the suspension bracket assembly is determined by matching reference hole "B" with the prescribed platform clevis number and placing the suspension bracket assembly in the direction where it can be secured within the same panel bolt configuration. Figure 3-3 shows the suspension bracket assemblies installed. Table 3-1 shows the maximum allowable suspended weights for the four-point and centerline suspension systems. Figure 3-4 details the centerline suspension system.

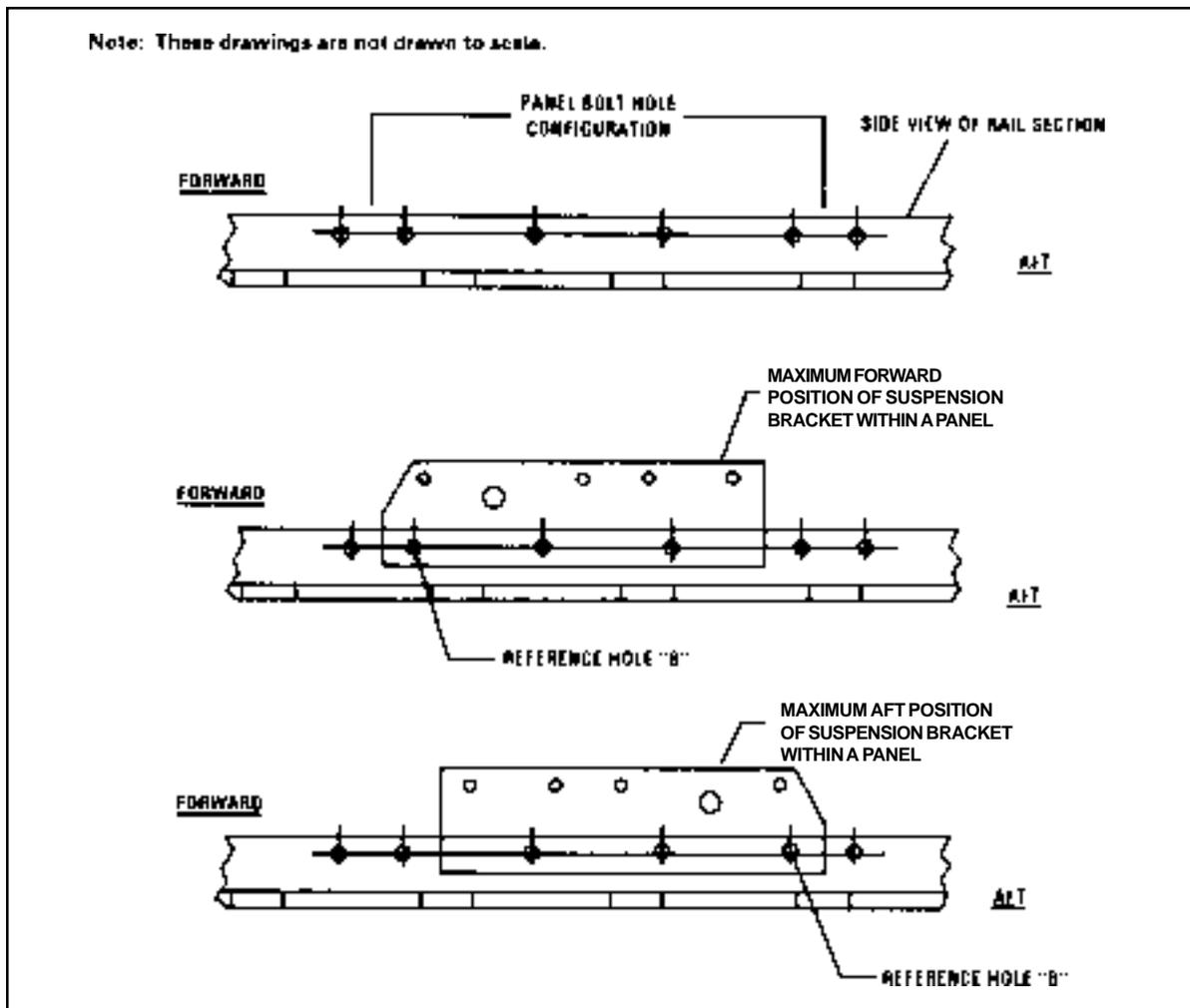
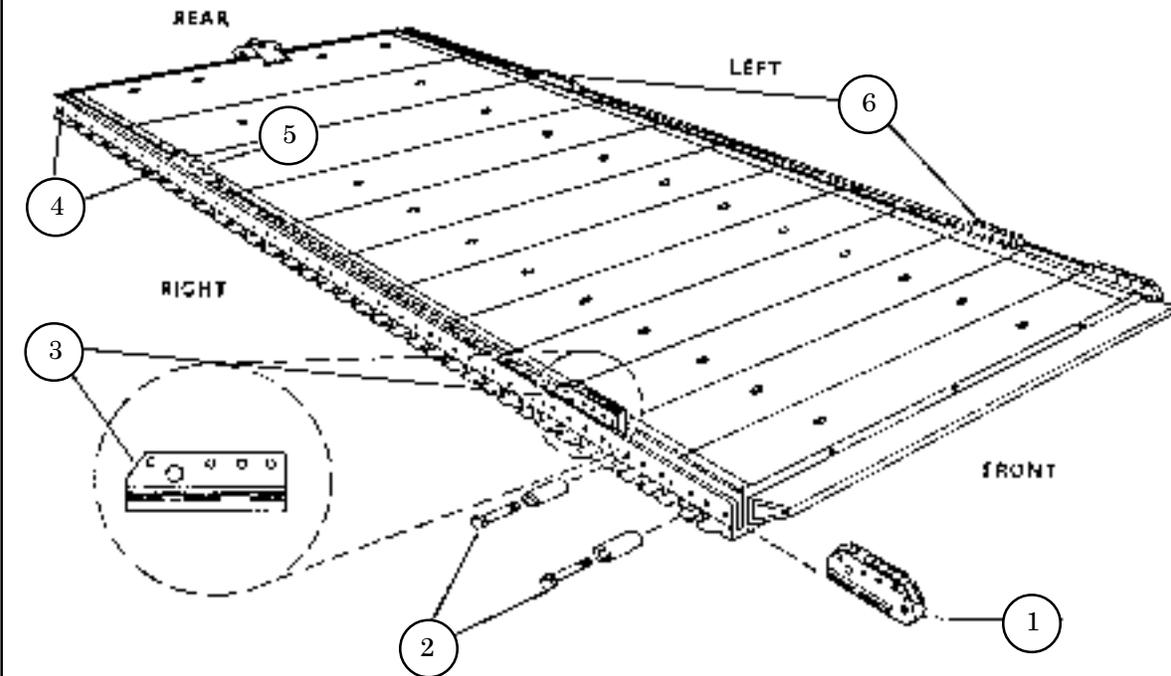


Figure 3-2. Bolt Configuration of a Panel

Note: This drawing is not drawn to scale.



- 1 Remove the tandem link on the front of the right platform rail.
- 2 Remove the required bushings, as given in the specific rigging manual, from the bushing holes in the right rail.
- 3 Insert a suspension bracket assembly on the front end of the right rail. Slide the bracket assembly along the rail until the holes in the bracket assembly align with the required rail holes. Bolt the bracket assembly in place with the bushing bolts. Reinstall the required bushings and bolts.
- 4 Remove the required bushings, as given in the rigging manual, from the bushing holes in the right rail.
- 5 Insert a suspension bracket assembly on the rear of the right rail. Slide the bracket assembly along the rail until the holes in the bracket assembly align with the required rail holes. Bolt the bracket assembly in place with the bushing holes. Reinstall the required bushings and bolts.
- 6 Install two suspension bracket assemblies on the left rail, adapting the procedures in steps 1 through 5 above.
- 7 Reinstall the tandem link assembly from step 1

Figure 3-3. Suspension Bracket Assemblies Installed

**Table 3-1. Maximum Allowable Suspended Weights for the Four-Point and Centerline Suspension Systems**

<b>Four-Point Suspension System</b>		
<p>The following table lists the maximum allowable suspended weights along with the suspension bracket assembly and/or tandem link position. All links positioned along the most forward and aft panels will be tandem links. All other positions along the platform side rail will use the suspension bracket assembly.</p>		
Platform Length (feet)	Suspension/Tandem Link Positions (platform clevis numbers)	Maximum Suspended Weight (pounds)
8	3, 3A, 14, 14A	14,250
12	3, 3A, 22, 22A	14,000
16	3, 3A, 30, 30A	9,300
16	8, 8A, 25, 25A	26,000
20	8, 8A, 33, 33A	19,000
<b>Centerline Suspension System</b>		
<p>The centerline suspension system consists of eight suspension bracket assemblies, four of which form a bridge on each side of the platform in the center and six suspension slings. Figure 3-4 details the configuration. The following table lists the maximum suspended weights along with the position of the suspension bracket assemblies on the platform rails.</p>		
Platform Length (feet)	Suspension/Tandem Link Positions (platform clevis numbers)	Maximum Suspended Weight (pounds)
20	5, 5A, 36, 36A 17, 17A, 24, 24A	25,000
24	8, 8A, 41, 41A 20, 20A, 29, 29A	40,000
28	8, 8A, 49, 49A 24, 24A, 33, 33A	36,000
32	8, 8A, 57, 57A 28, 28A, 37, 37A	23,000
<p><b>Note:</b> All maximum suspended weights can be higher with specific loads which increase the rigidity of the platform. Methods that differ from the suspension systems described above are given in the specific rigging manuals.</p>		

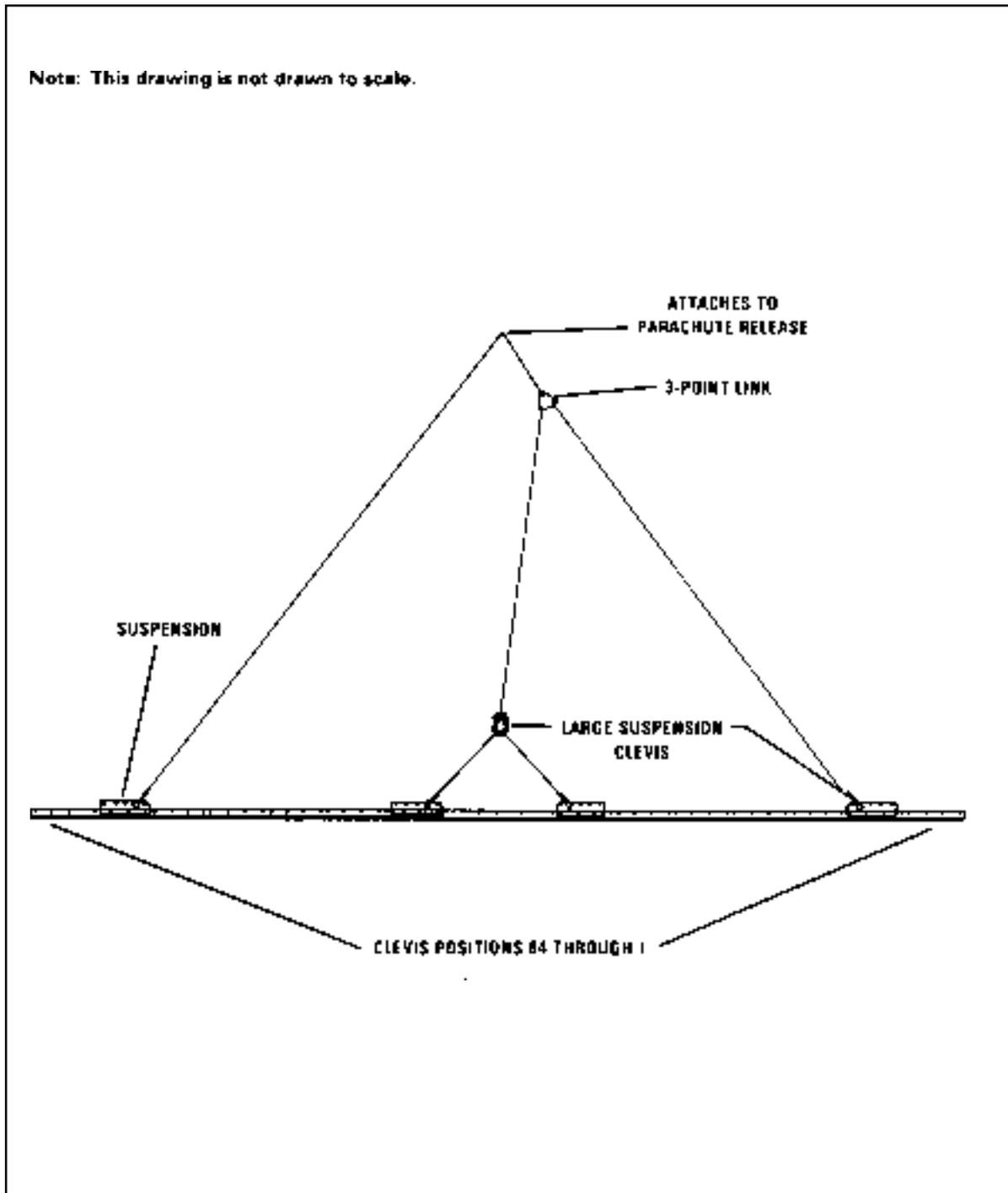


Figure 3-4. Centerline Suspension System Shown on a 32-Foot Platform

## PREPARING THE TYPE V PLATFORM

3-3. The platform must be prepared by attaching clevises, tandem links or suspension bracket assemblies according to the specific rigging manual. Figure 3-5 gives an example of how to bolt the clevises to the bushings in the platform side rails and how to number them.

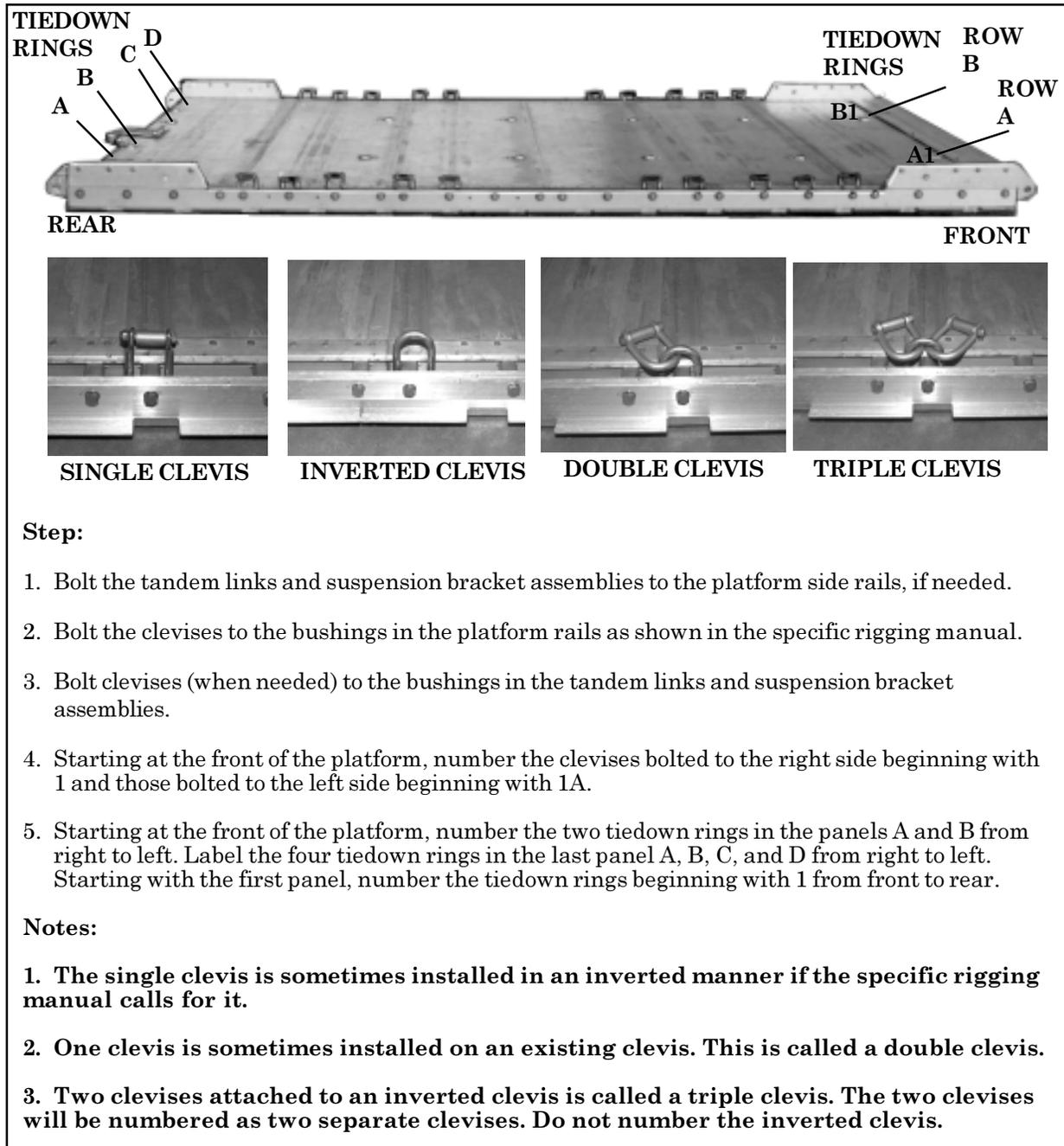
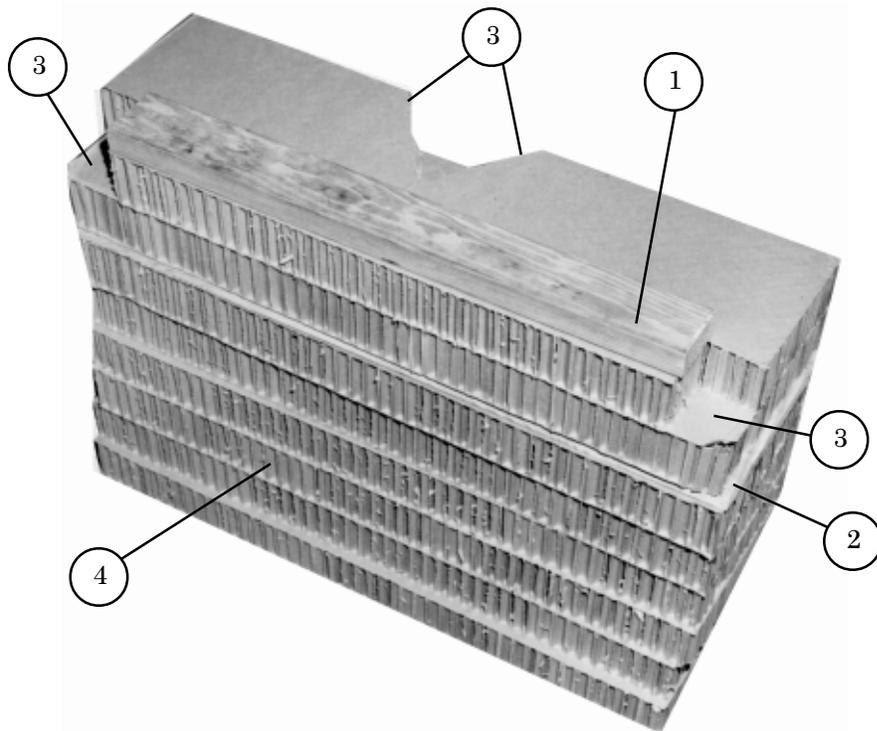


Figure 3-5. Type V Platform Prepared

## BUILDING HONEYCOMB STACKS

3-4. Honeycomb stacks must be prepared according to the specific rigging manual. Honeycomb is used to absorb the landing shock. Figure 3-6 shows a typical honeycomb stack.

**Note: When honeycomb stacks are longer than 96 inches or wider than 36 inches, alternate the layers to build a solid, cohesive stack.**



- ① Lumber
- ② Plywood
- ③ Cutouts or notches
- ④ Layers of honeycomb

**Note: Glue the layers of the stack together.**

**Figure 3-6. Typical Honeycomb Stack**

## PLACING HONEYCOMB STACKS

3-5. Honeycomb stacks must be set on the platform according to instructions in the specific rigging manual. Figure 3-7 shows a typical placement of honeycomb stacks on a type V platform.

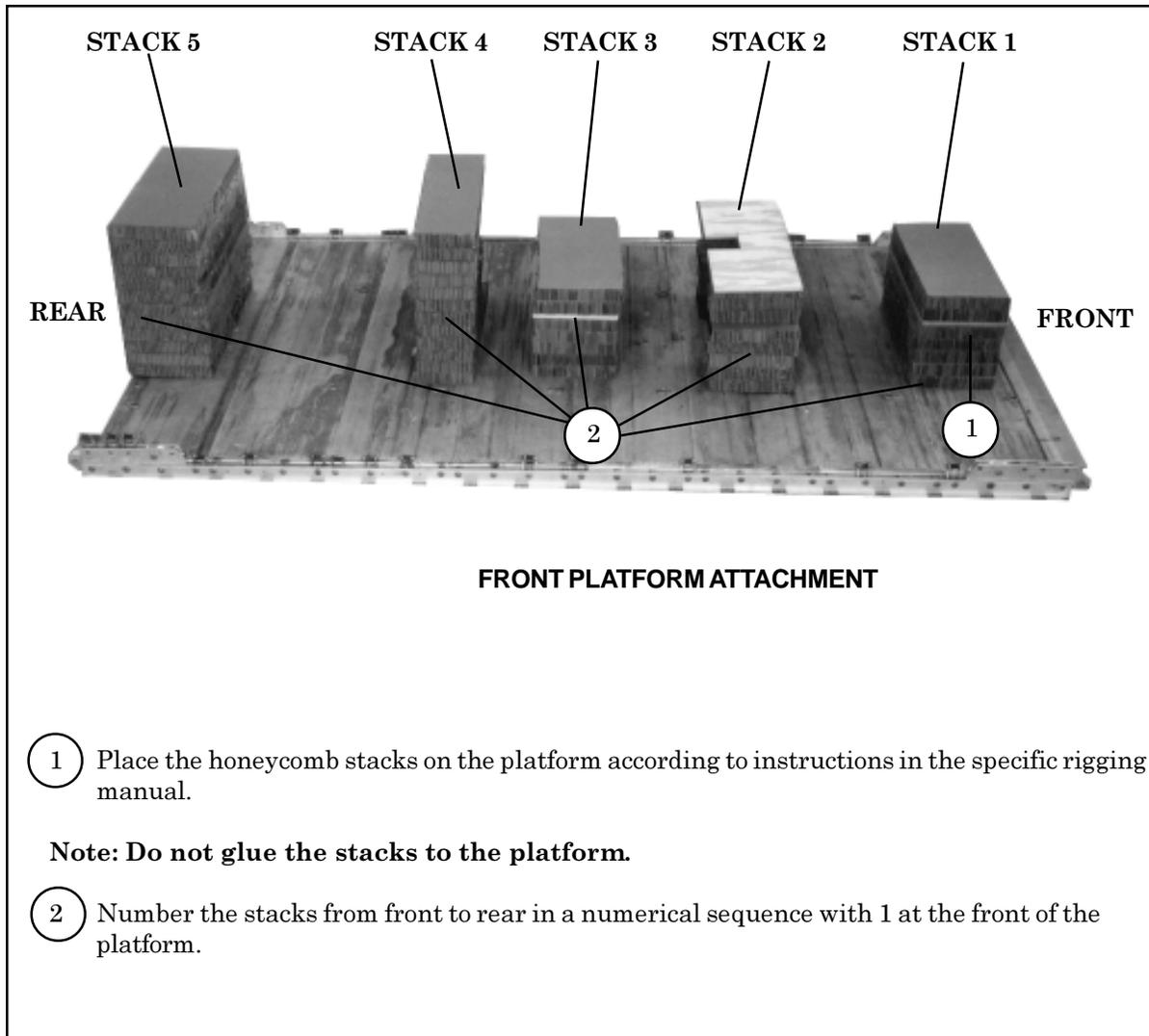


Figure 3-7. Typical Placement of Honeycomb Stacks on Platform

## DRIVE-OFF AID AIRDROP

3-6. The drive-off aid may be used with the HMMWV, 2 1/2-ton truck, and the 5-ton, 900-series truck. The drive-off aid, showing the front and rear platform attachment, (Figure 3-8), consists of a fabric track constructed of type X webbing sewn into a ladder-type configuration. The system is placed on two of the identified vehicle's tires and attached to the type V platform tiedown rings with a tiedown clevis or type V webbing. There are two tracks to each system. Each track is 30 feet long and 22 inches wide and weighs 21 pounds. When powered up, the vehicle (with tiedown assemblies removed), will progressively wrap the webbed ladder around the two tires (using the platform for leverage) and pull itself clear of the honeycomb and platform. Figure 3-9 shows the drive-off aid installed on the vehicle wheels.



**REAR PLATFORM ATTACHMENT**

**Note:** If the vehicle is to be driven off the rear of the platform, attach the drive-off aid to the outside tiedown rings on each side with a type V tie-down clevis.



**FRONT PLATFORM ATTACHMENT**

**Note:** If the vehicle is to be driven off the front of the platform, tie a length of type V nylon webbing or 1-inch tubular nylon webbing from the second bushing of the front tandem link, through the end loop of the drive-off aid, and through the nearest tie-down ring. When attaching the drive-off aid to the type V platform using type V webbing, tie the free ends with a ring bend knot as shown in Figure 1-3. Tie the drive-off aid to tie-down rings or platform bushings with type I, 1 1/4-inch cotton webbing.

**Figure 3-8. Installing Drive-off Aids on Platform**

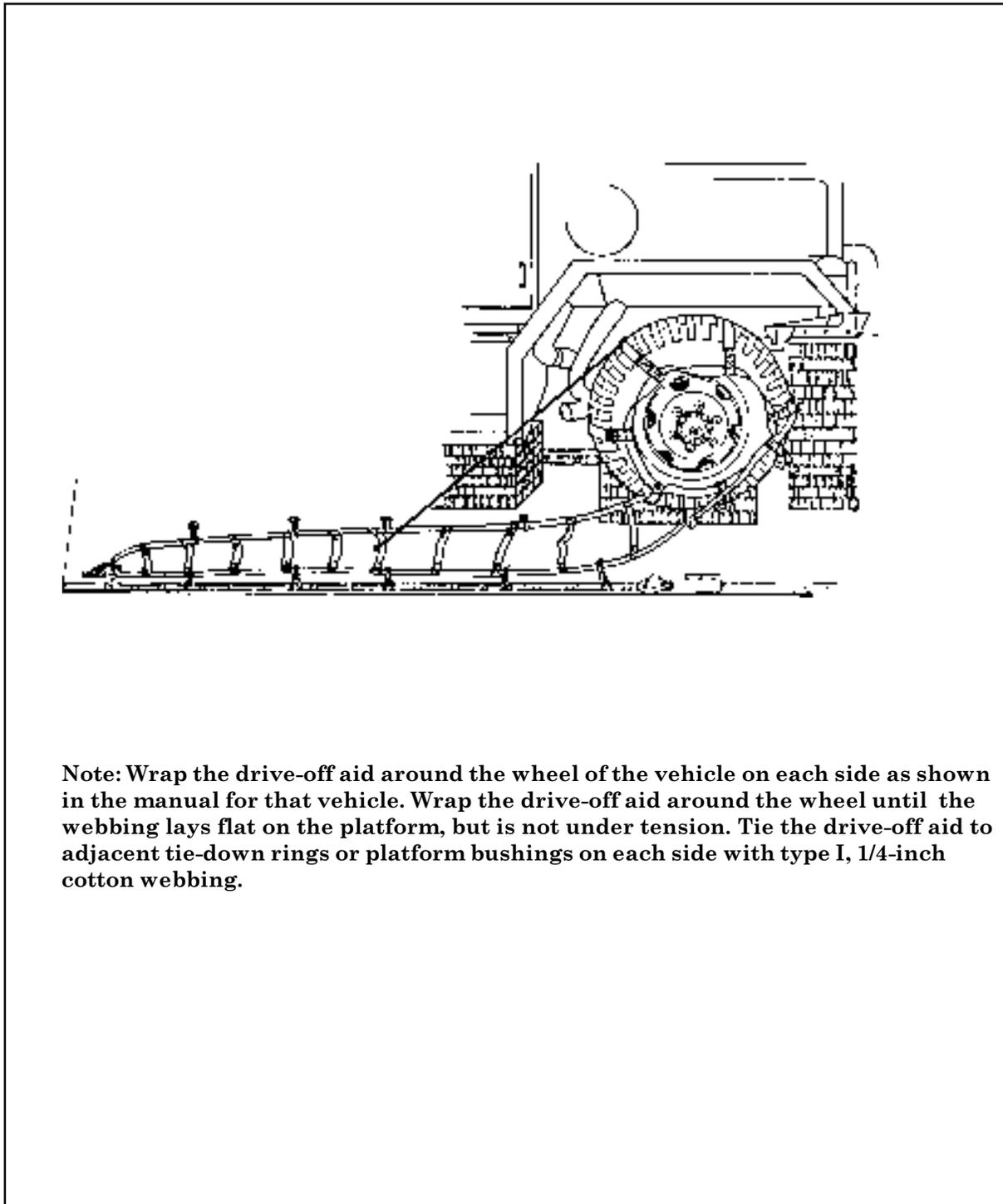


Figure 3-9. Installing Drive-off Aids on Wheel of Vehicle

## Section II

# Accompanying Load And Drop Items

## STOWING ACCOMPANYING LOADS

3-7. Each specific rigging manual contains the weight limitations, placement, and any additional restrictions on accompanying loads. Exact instructions for lashing the accompanying load are given in the specific rigging manual.

### CAUTIONS

1. Only ammunition listed in FM 10-500-53/ MCRP 4-3.8/TO 13C7-18-41 may be rigged for airdrop.
2. Hazardous materials must be packaged, marked, and labeled as required by AFJMAN 24-204/TM 38-250.
3. At least two layers of honeycomb must be placed under all ammunition rigged for airdrop unless the specific rigging manual states differently.

## PREPARING DROP ITEMS

3-8. Some items need to be prepared for rigging. This preparation can include removing, reinforcing, stowing, and securing components. Detailed preparation instructions will be included in the specific rigging manual.

## COVERING LOAD

3-9. Covers may be needed to protect the load and keep the suspension slings from fouling. To keep the load from being damaged by falling hardware such as parachute releases, it may be necessary to cover portions of the load with honeycomb or cloth protectors. If a cover is needed, the specific rigging manual will include this information and the procedures for its installation.

Section III

## Suspension Slings And Lashings

### ATTACHING SLINGS

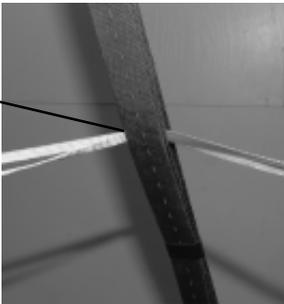
3-10. The specific rigging manual includes the length and loops of suspension slings needed and the method used to connect them to the platform or drop item. When suspension slings must be joined to form a longer suspension sling, a two-point link may be used. Attach suspension slings to the suspension bracket assembly or tandem links using large suspension clevises.

**CAUTION**  
**The nuts must be tight enough to keep them from loosening during transport and airdrop.**

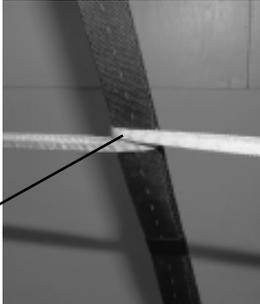
### SAFETY TIEING SLINGS

3-11. Safety tying the suspension slings keeps them from entangling with the load. Safety tie the slings according to the instructions given in the specific rigging manual for the particular load. Safety tie all suspension slings with a deadman's tie as shown in Figure 3-10.

**CAUTION**  
**This tie must be located between 6 and 8 inches above the top of the load or as directed in the specific rigging manual.**



1



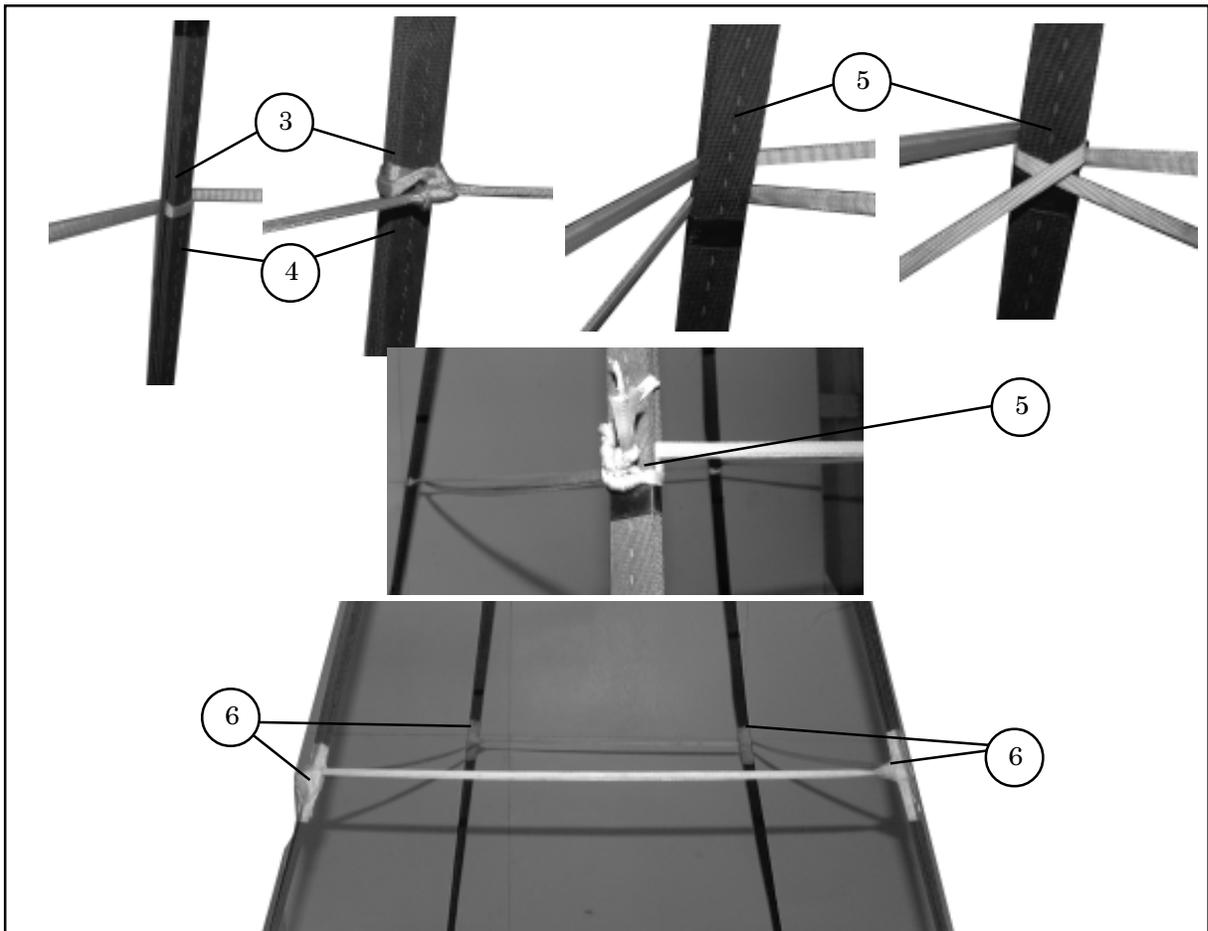
2



2

- 1 Cut two lengths of 1/2-inch tubular nylon webbing, making each long enough to encircle all slings plus 8 feet. Mark the lengths of webbing at their centers. Pass an end of both pieces of webbing through the center plies of the right front sling until the marks reach the sling.
- 2 Pass the running end of each length around the inboard side. Tie it on the outboard side with a surgeon's knot, a locking knot, and an overhand knot in the running ends.

**Figure 3-10. Safety Tying Slings with a Deadman's Tie**



- 3 Pass one running end to the left front sling, through the center plies, around the inside of the plies to the outside. Tie it to the inside of the plies with three alternating half hitches and an overhand knot in the running end.
- 4 Repeat step 3 for the right rear sling.
- 5 Run both ends of the webbing through the center plies of the left rear sling and around the inboard side of the sling to the outboard side. Safety tie it with a surgeon's knot, a locking knot, and an overhand knot in the free ends.
- 6 Tape the webbing to the slings.
- 7 When using four-loop, type XXVI suspension slings, wrap each four plies with a 10- by 10-inch piece of cotton muslin. Secure each wrap with one single turn of 1/4-inch cotton webbing. (Not shown)

**Note: Make sure the safety tie allows the slings to suspend in their natural position.**

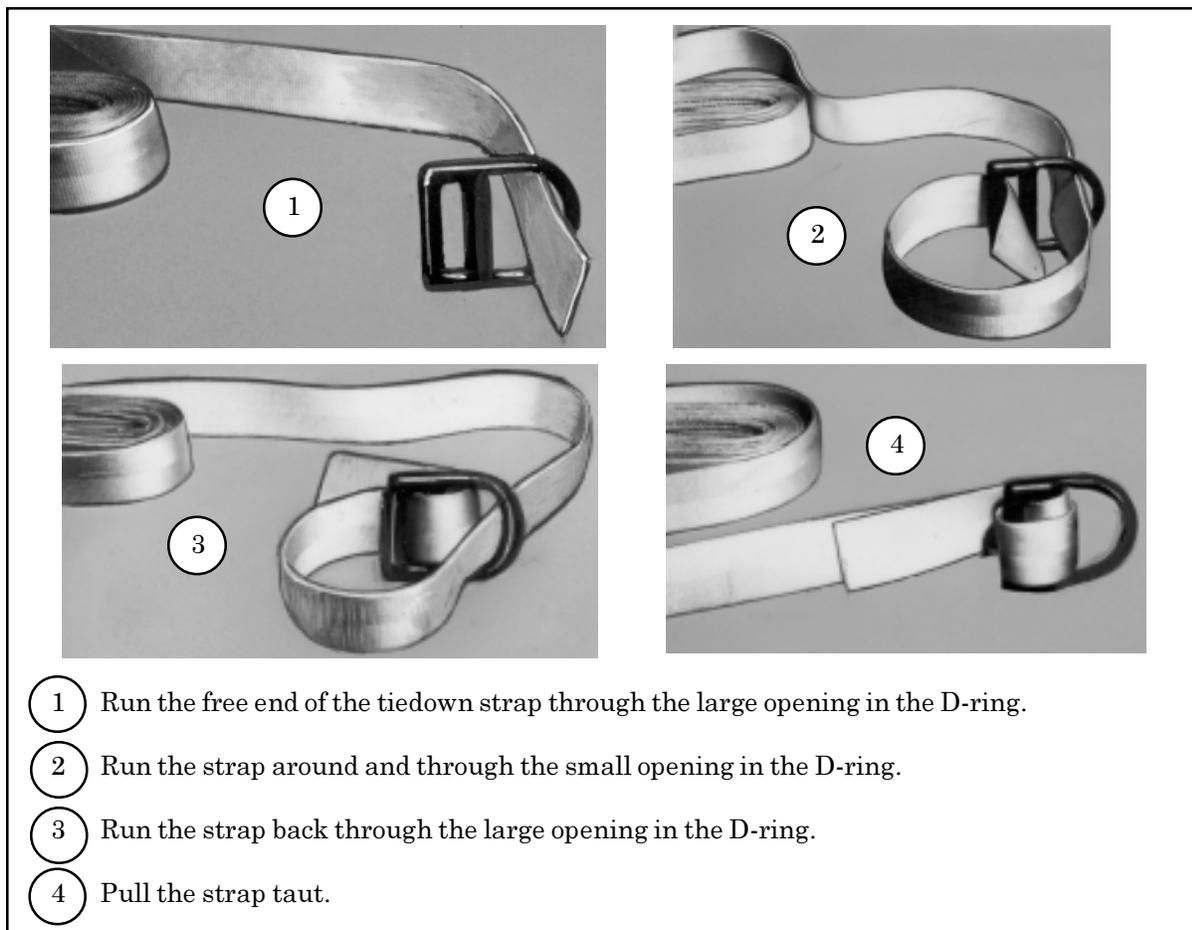
**Figure 3-10. Safety Tying Slings with a Deadman's Tie (Continued)**

## FITTING D-RINGS

3-12. Fit a D-ring to the end of each tiedown strap as shown in Figure 3-11.

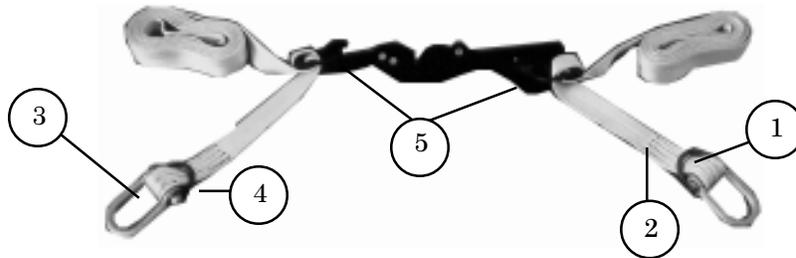
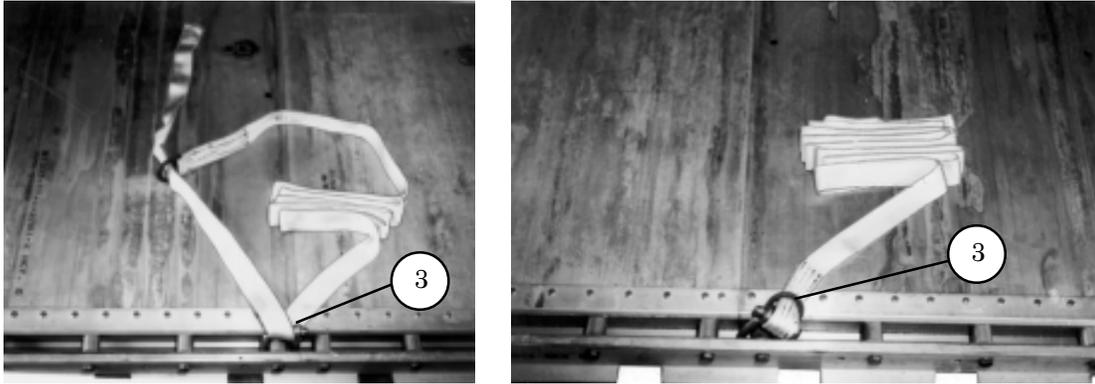
## LASHING LOAD

3-13. Lash a low-velocity airdrop load to the platform according to the instructions in the specific rigging manual. Install the lashings as shown in Figures 3-12 and 3-13. When a load is rigged for which there is no specific rigging manual, lashings must provide restraint to withstand extraction, recovery, and ground impact forces. Airdrop loads that do not have specific rigging procedures must be restrained to the airdrop platform to the following criteria: 3Gs forward, 2.25 Gs aft, 1.5 Gs lateral, and 2 Gs vertical. The total force that is necessary to restrain a load in a given direction is determined by multiplying the weight of the load times the specific G value for that restraint direction. Lashing effective strength is determined as shown in Table 2-4.



**Figure 3-11. D-Ring Fitted to Tiedown Strap**

**CAUTION**  
Do not tighten the lashings so tight that they cause the platform to bow especially in the aircraft.

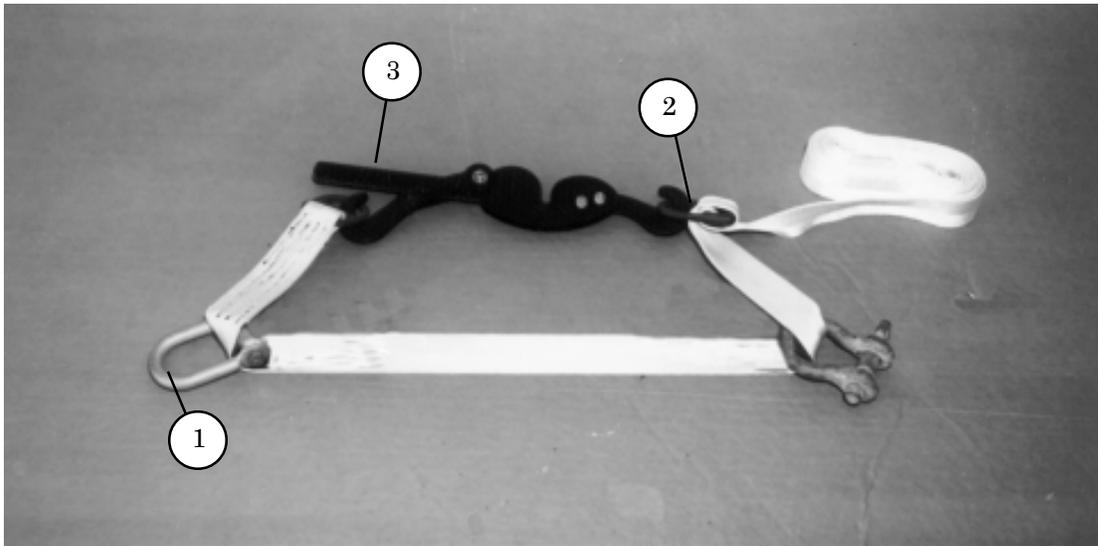


- 1 Pass the free end of one tiedown strap through a clevis on the right rail and through its own D-ring. Pull the strap taut.
- 2 Run the free end of the strap up over the load.
- 3 Pass the free end of a second tiedown strap through a clevis on the left rail and through its own D-ring. Pull the strap taut.
- 4 Run the free end of the strap up over the load.
- 5 Fit a D-ring on the free end of each strap as described in Figure 3-11, and place the D-rings on the hooks of a load binder. Safety the binder handle closed as shown in Figure 3-14.

**Notes:**

1. When the tiedown strap length is not a factor, it is permissible to use a single tiedown strap and D-ring with a load binder attached directly to a side rail clevis or tiedown ring.
2. Pad all sharp edges that may touch the strap with cellulose wadding or other suitable material.

**Figure 3-12. Single Line Lashing**

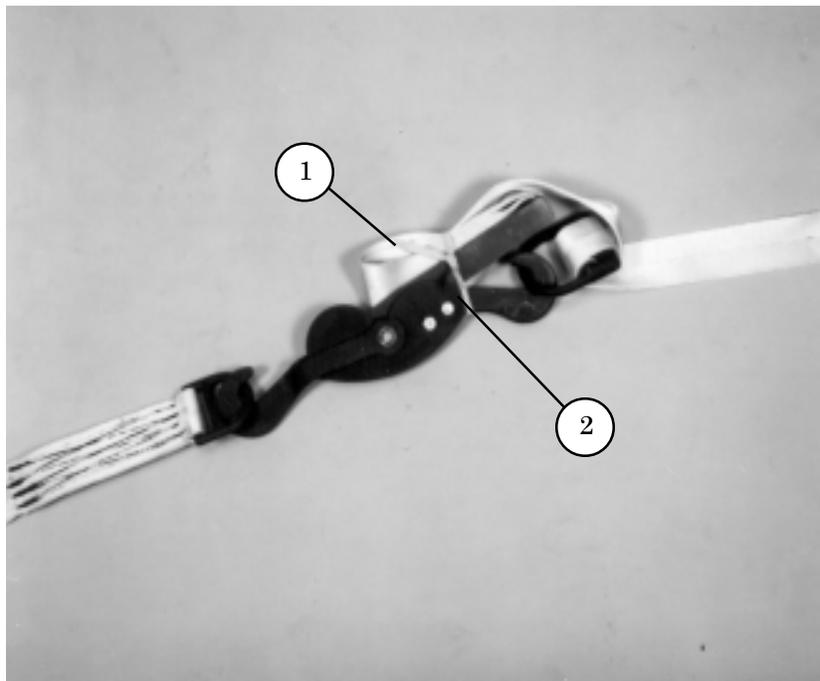


- 1 Pass the free end of a tiedown strap through a clevis on a rail and up and over, around, or through the indicated tiedown provision on the load. The tiedown provision will be listed in the specific rigging manual for a particular load. Run the strap back toward the clevis.
- 2 Fit a D-ring to the free end of the strap (Figure 3-11), and place the D-rings on the hooks of a load binder. Close the handle of the load binder pointing toward the platform.
- 3 Safety the binder handle closed as shown in Figure 3-14.

**Figure 3-13. A Looped (Floating Binder) Lashing**

## SAFETY TIEING LOAD BINDER HANDLES

3-14. Fold the excess tiedown strap, and place the folds alongside the load binder handle. Safety tie the load binder handle closed as shown in Figure 3-14.



- ① After the handle of the load binder has been closed, fold or roll any excess tiedown strap and place the folds alongside the load binder handle.
- ② Tie the folded webbing to the binder and the binder handle closed with a single length of type I, 1/4-inch cotton webbing.

**Figure 3-14. Load Binder Handle and Excess Webbing Safety Tied**

## FORMING A 30-FOOT, 45-FOOT, OR GREATER LENGTH TIEDOWN STRAP

3-15. When needed, attach 15-foot tiedown straps together to form a 30-foot, 45-foot, or greater length tiedown strap as shown in Figure 3-15.

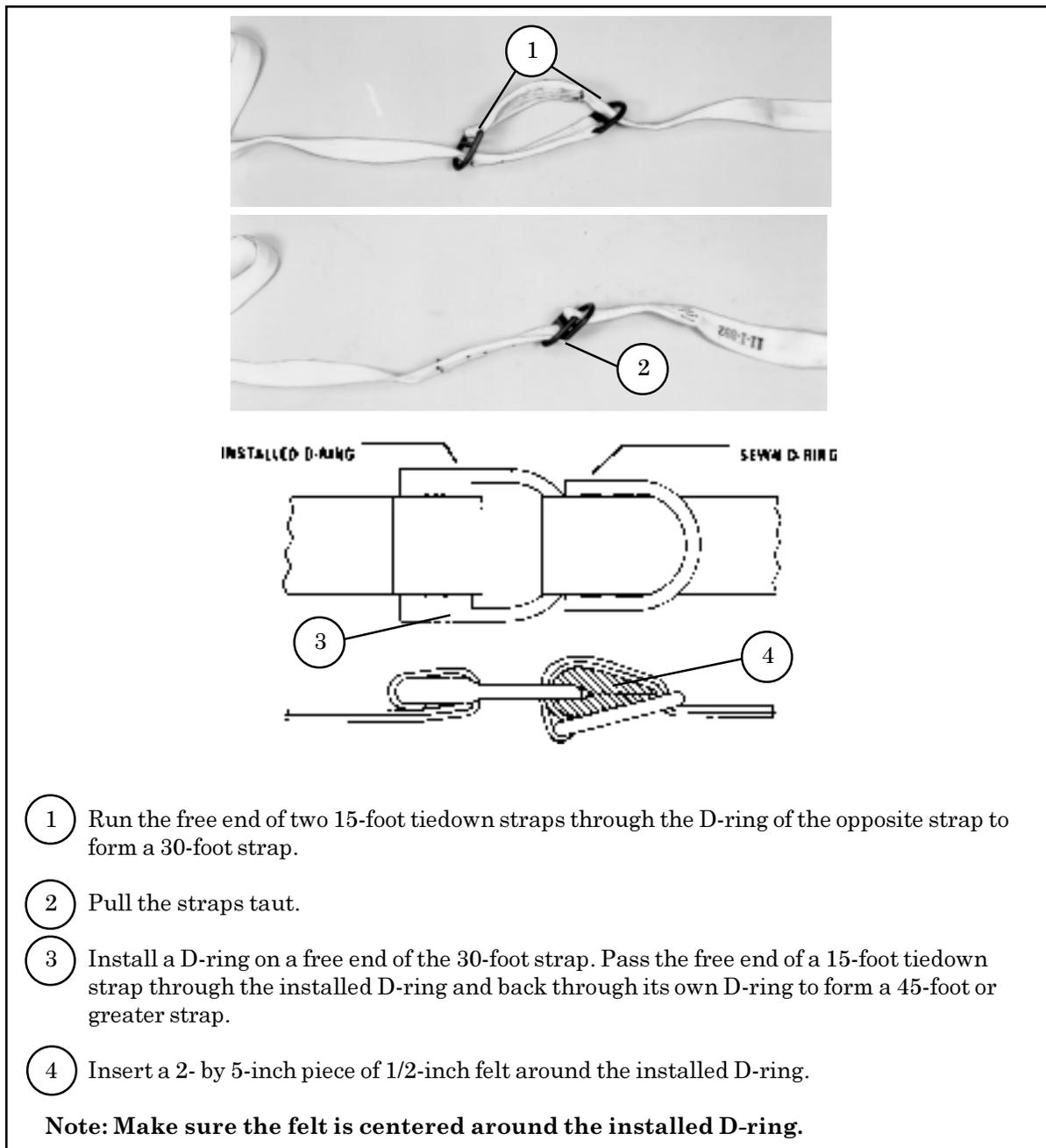


Figure 3-15. A 30-Foot, 45-Foot, or Greater Length Tiedown Strap Formed

Section IV

## Cargo Parachutes

### RISER EXTENSIONS

3-16. The risers of a cluster of cargo parachutes used on low-velocity airdrop loads must be extended (lengthened). The length of the extension needed for the cluster is given in Table 2-6.

- a. Forming Extensions.* Only continuous riser extensions may be used.
- b. Bolting Extensions to Risers.* Bolt the riser extension to the risers of a cargo parachute as shown in Figure 3-16.

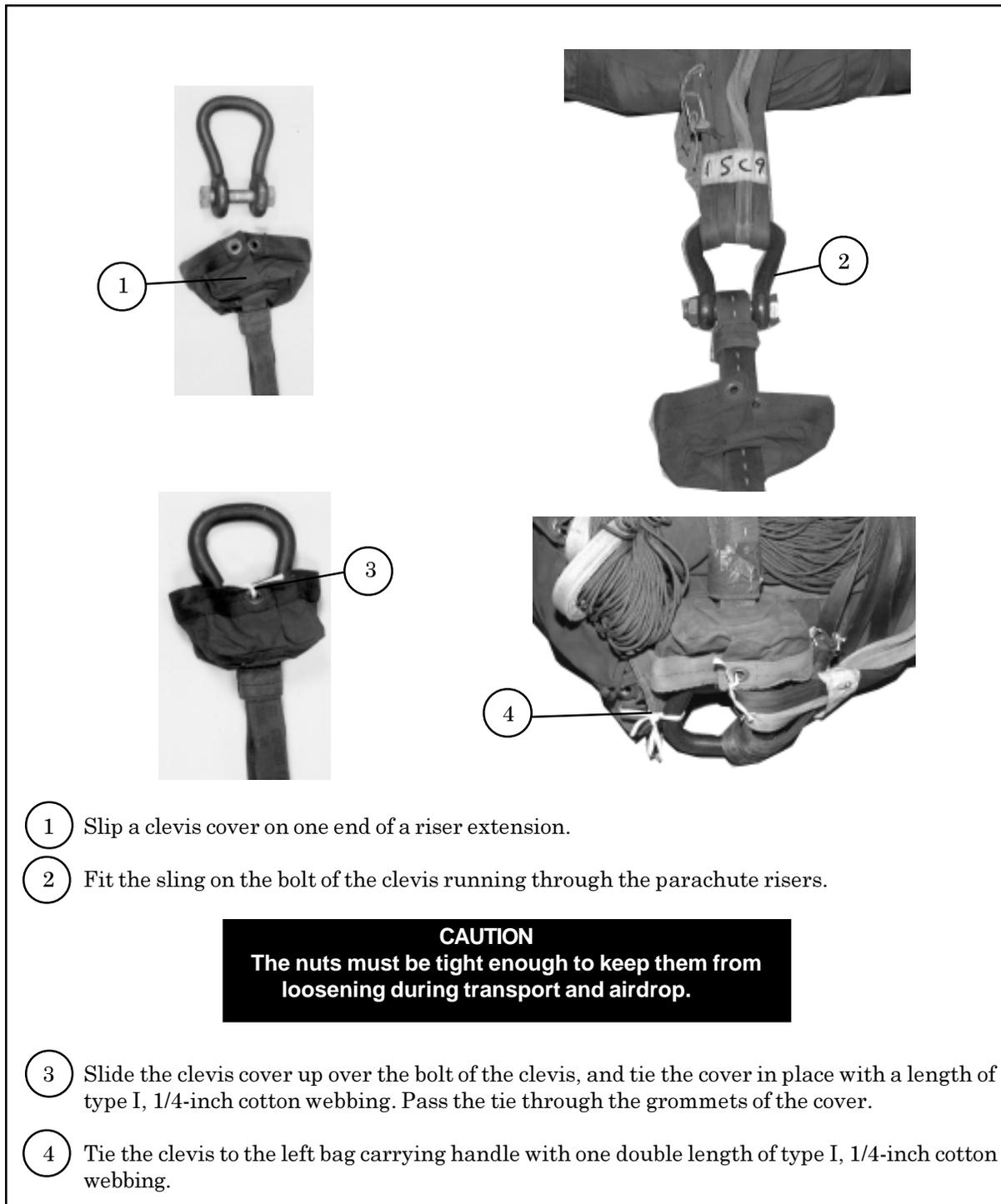


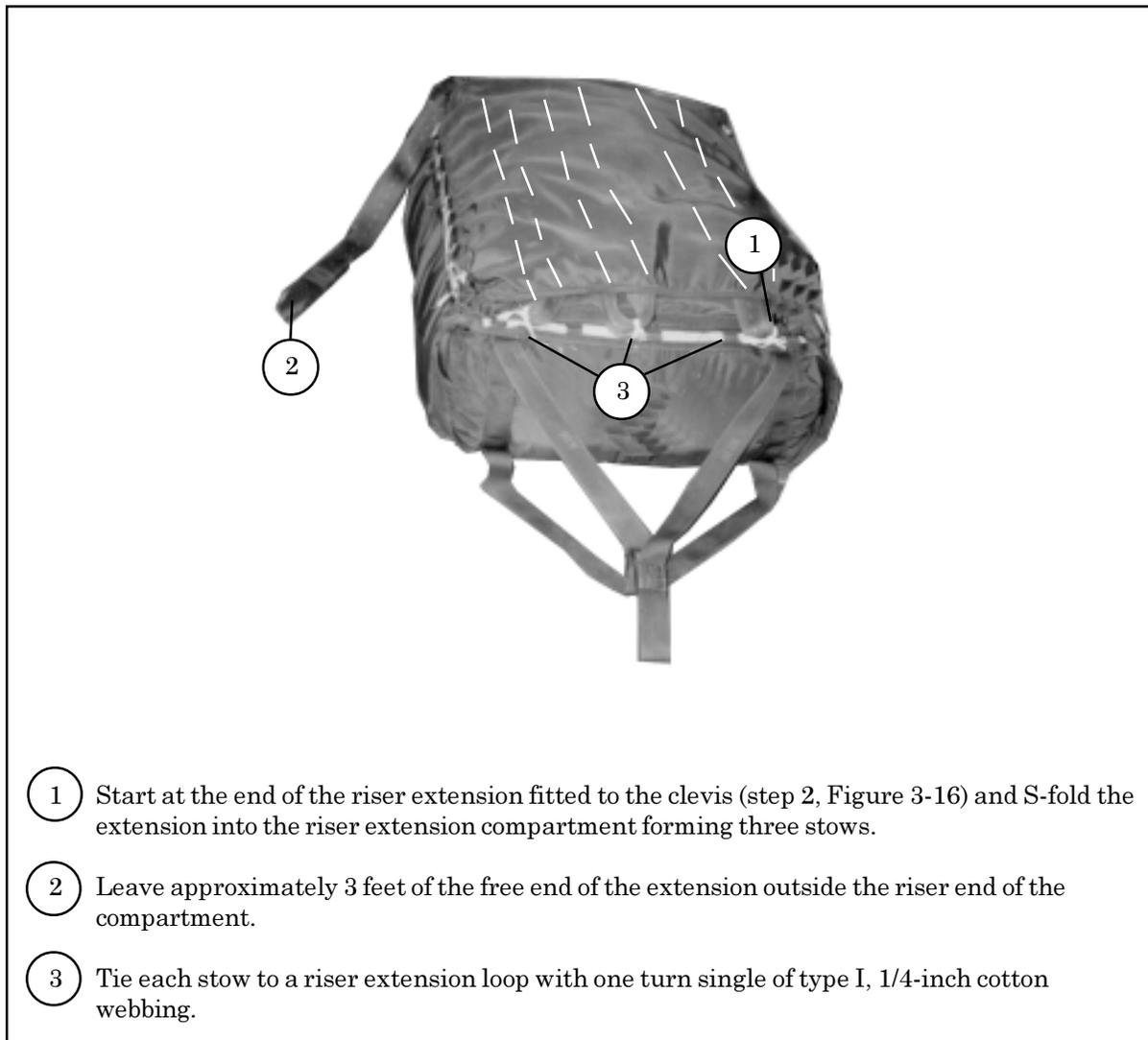
Figure 3-16. Riser Extension Bolted to Risers

## STOWING RISER EXTENSIONS

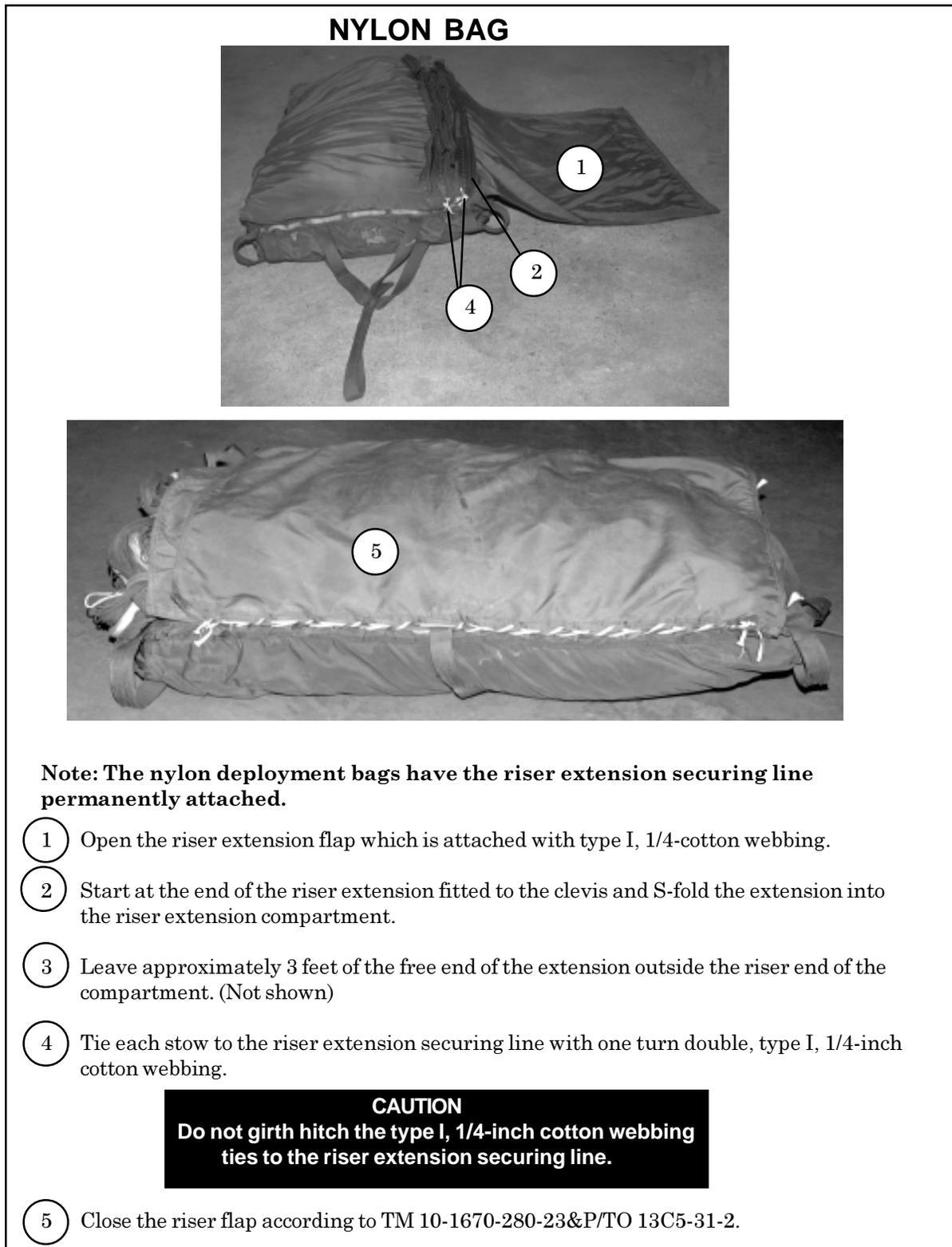
3-17. The riser extensions for the parachutes must be stowed as given below.

**a. G-12-E Cargo Parachute.** Stow the riser extension of a G-12E cargo parachute as shown in Figure 3-17.

**b. G-11B or G-11C Cargo Parachute.** Stow the riser extensions of a G-11B or G-11C cargo parachute as shown in Figures 3-18 and 3-19.

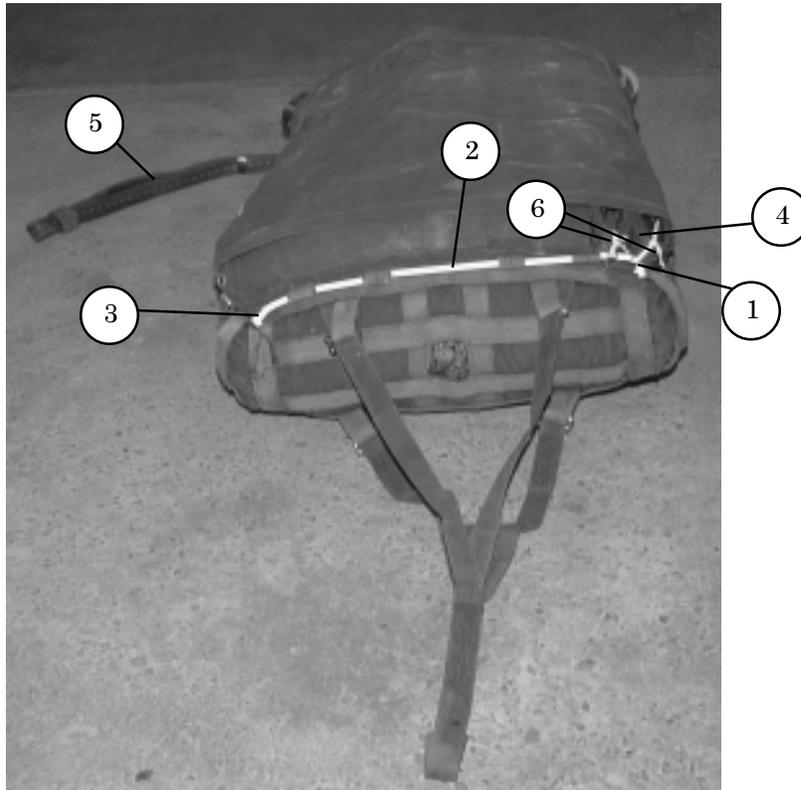


**Figure 3-17. Riser Extension of a G-12E Cargo Parachute Stowed**



**Figure 3-18. Riser Extension Securing Line Installed and Riser Extension Stowed**

**COTTON BAG**



1 Fold an 8-foot length of 1/2-inch tubular nylon webbing in half lengthwise. Run the loop in the folded end through the left carrying handle. Run the free ends of the webbing through this loop, and pull the webbing taut.

2 Run the webbing across the parachute, passing it through the riser extension retaining loops (end tabs).

**Note: Do not pull the webbing tight across the parachute.**

3 Tie the webbing to the left front carrying handle with three alternating half hitches and an overhand knot in each free running end.

4 Start at the end of the riser extension fitted to the clevis and S-fold the 20-foot extension into the riser extension compartment.

5 Leave about 3 feet of the free end of the extension outside the riser end of the compartment.

6 Tie each stow to the riser extension securing line with ties of doubled type I, 1/4-inch cotton webbing.

**CAUTION**  
Do not girth hitch the type I, 1/4-inch cotton webbing ties to the riser extension securing line.

**Figure 3-18. Riser Extension Securing Line Installed and Riser Extension Stowed (Continued)**



**20-FOOT RISER EXTENSION STOWED**



**60-FOOT RISER EXTENSION STOWED**



**60-FOOT RISER EXTENSION STOWED**



**120-FOOT RISER EXTENSION STOWED**

**Figure 3-19. The 20-, 60-, and 120-Footer Riser Extensions Stowed**

## STOWING CARGO PARACHUTES

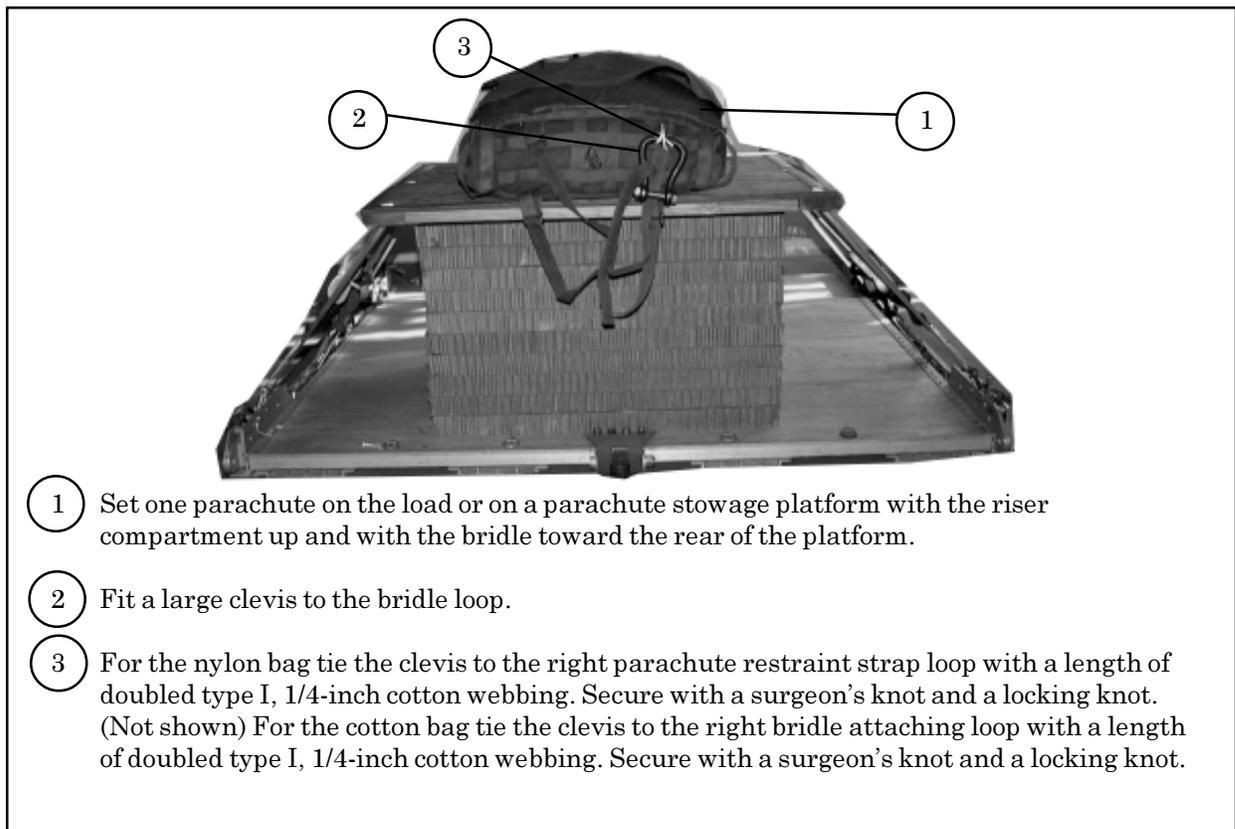
3-18. When referring to cargo parachutes, stowing consists of three steps. First, place the cargo parachutes on the load or on a parachute stowage platform. Second, cluster the parachutes by tying their deployment bags handles together. Third, group the bridles of a multiparachute load. Stow the parachutes as shown in Figures 3-20 through 3-27.

**Note: Nylon and cotton bags may be mixed on the same load.**

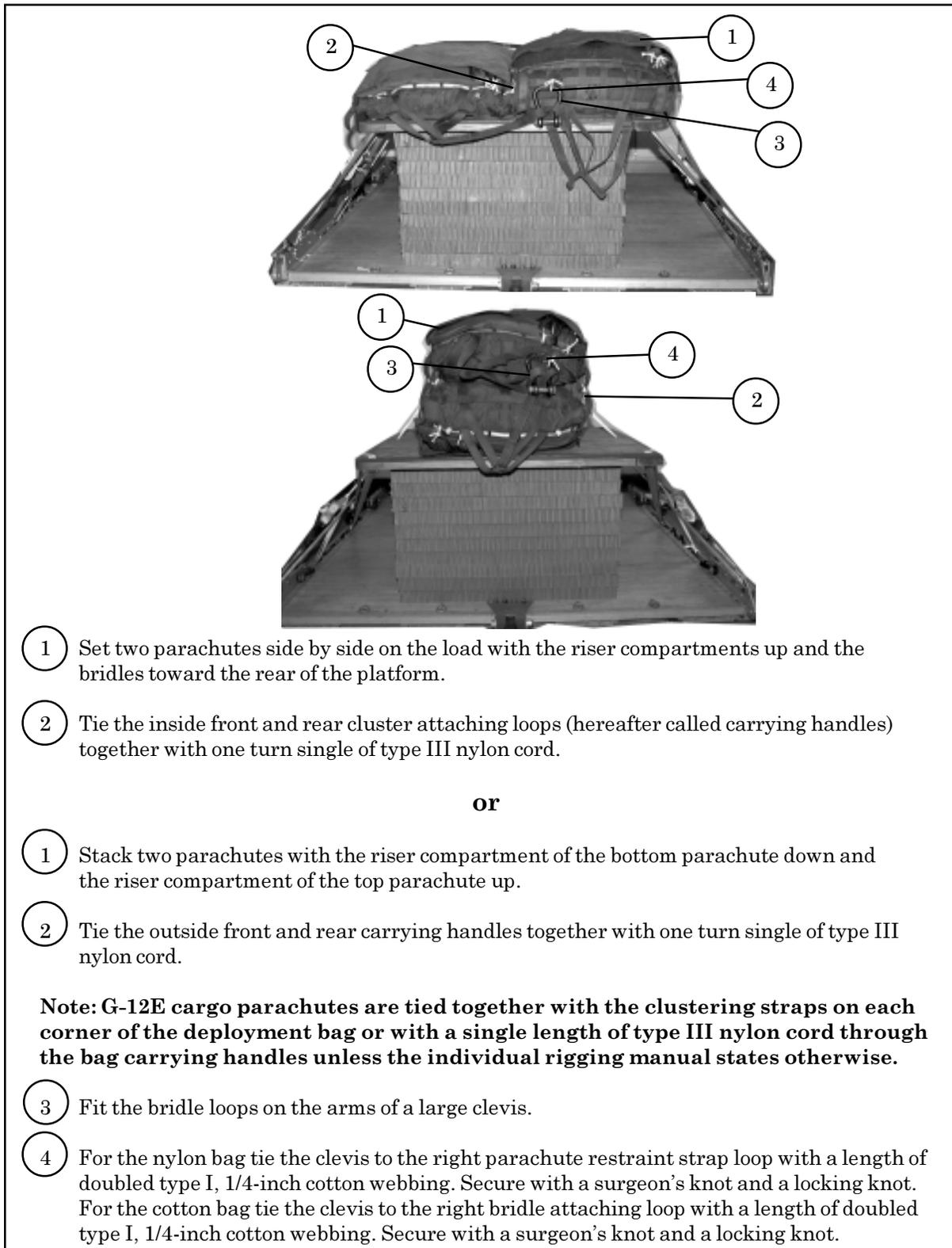
## USING DEPLOYMENT LINES

3-19. The correct size and length of the deployment line will be given in each specific rigging manual. As a rule, use 2-loop, type XXVI nylon slings as deployment lines. One end of the deployment line is fitted to the coupling link assembly of the EFTC. The other end of the line is fitted to the bolt of the large clevis grouping the bridles of a cluster of parachutes.

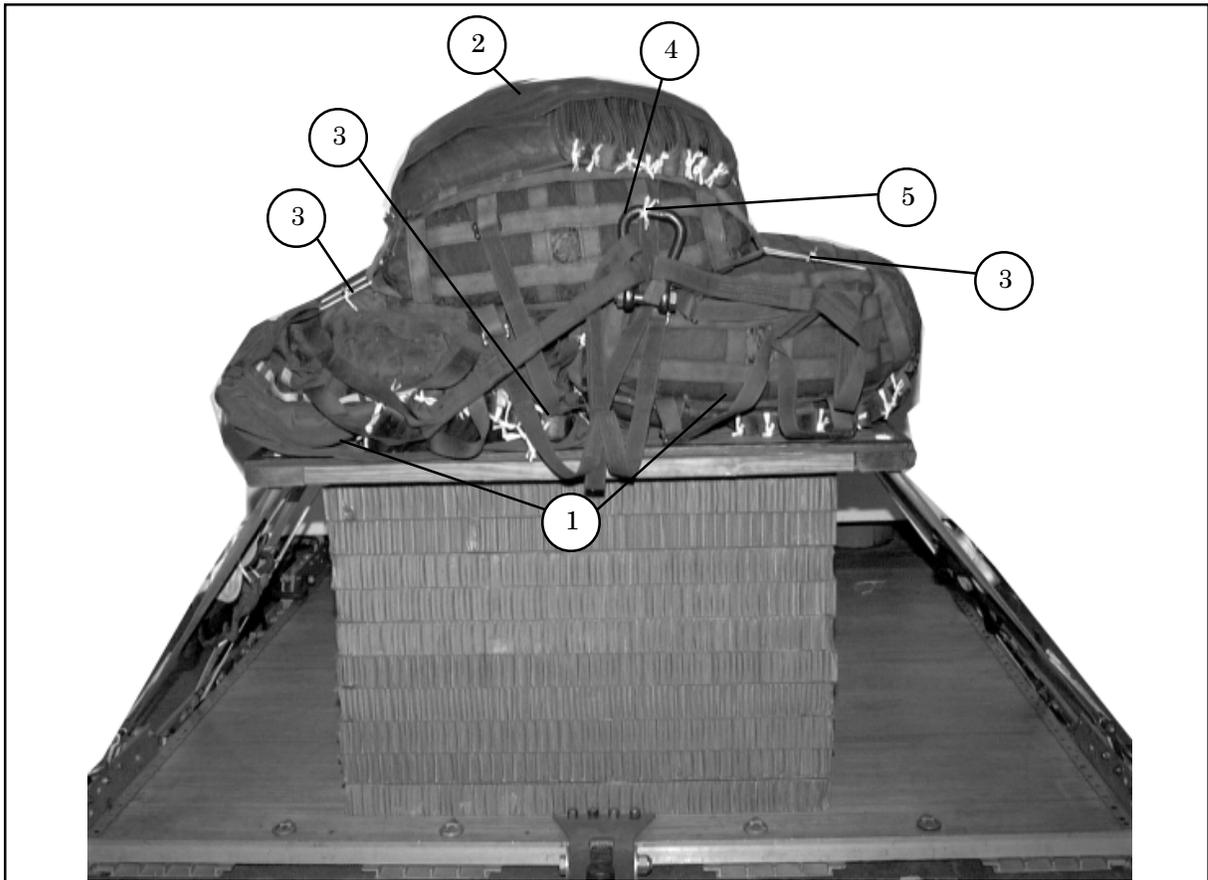
**Note: 4-loop slings may be substituted for 2-loop slings for deployment lines.**



**Figure 3-20. One Parachute Stowed**

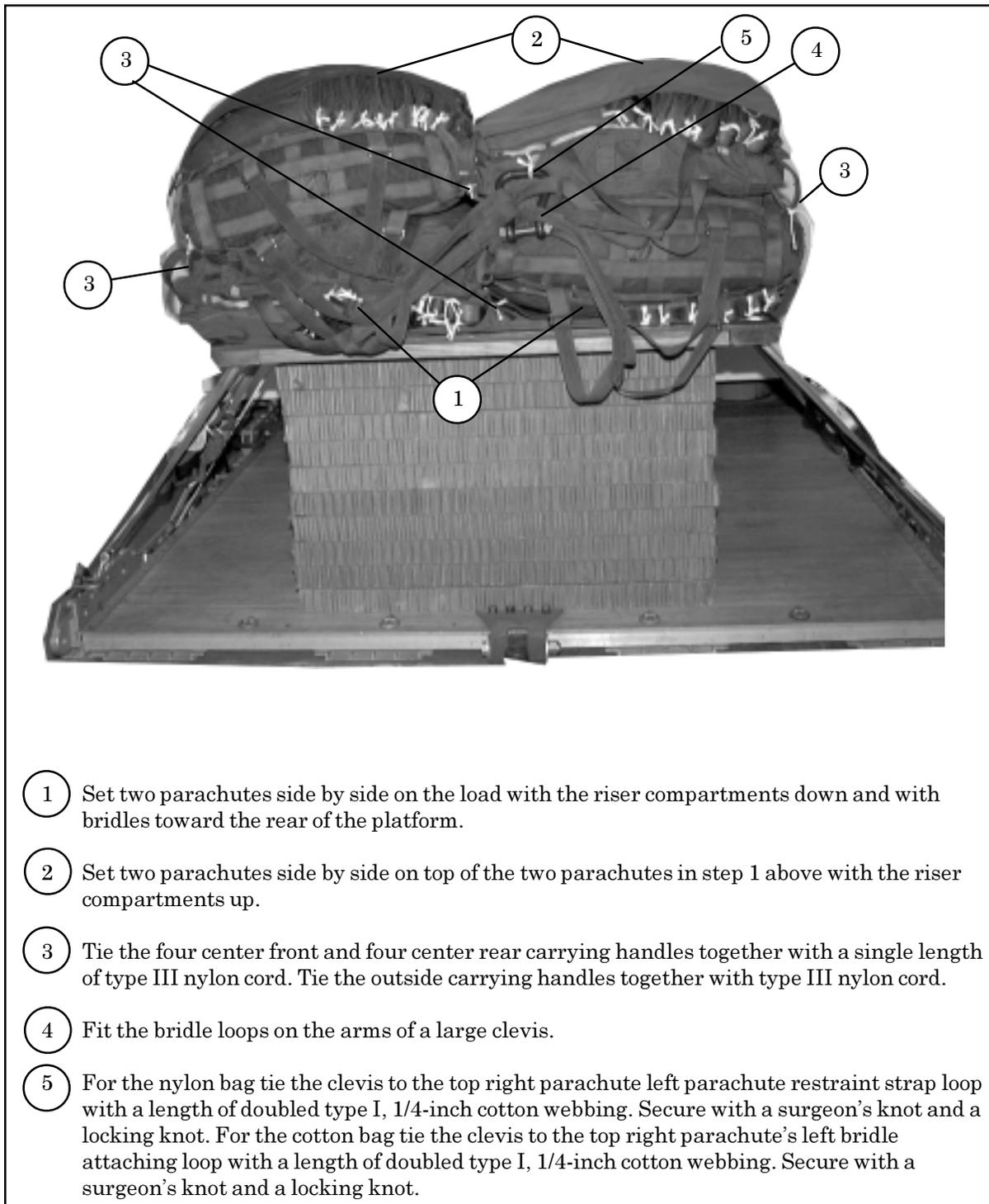


**Figure 3-21. Two Parachutes Stowed**

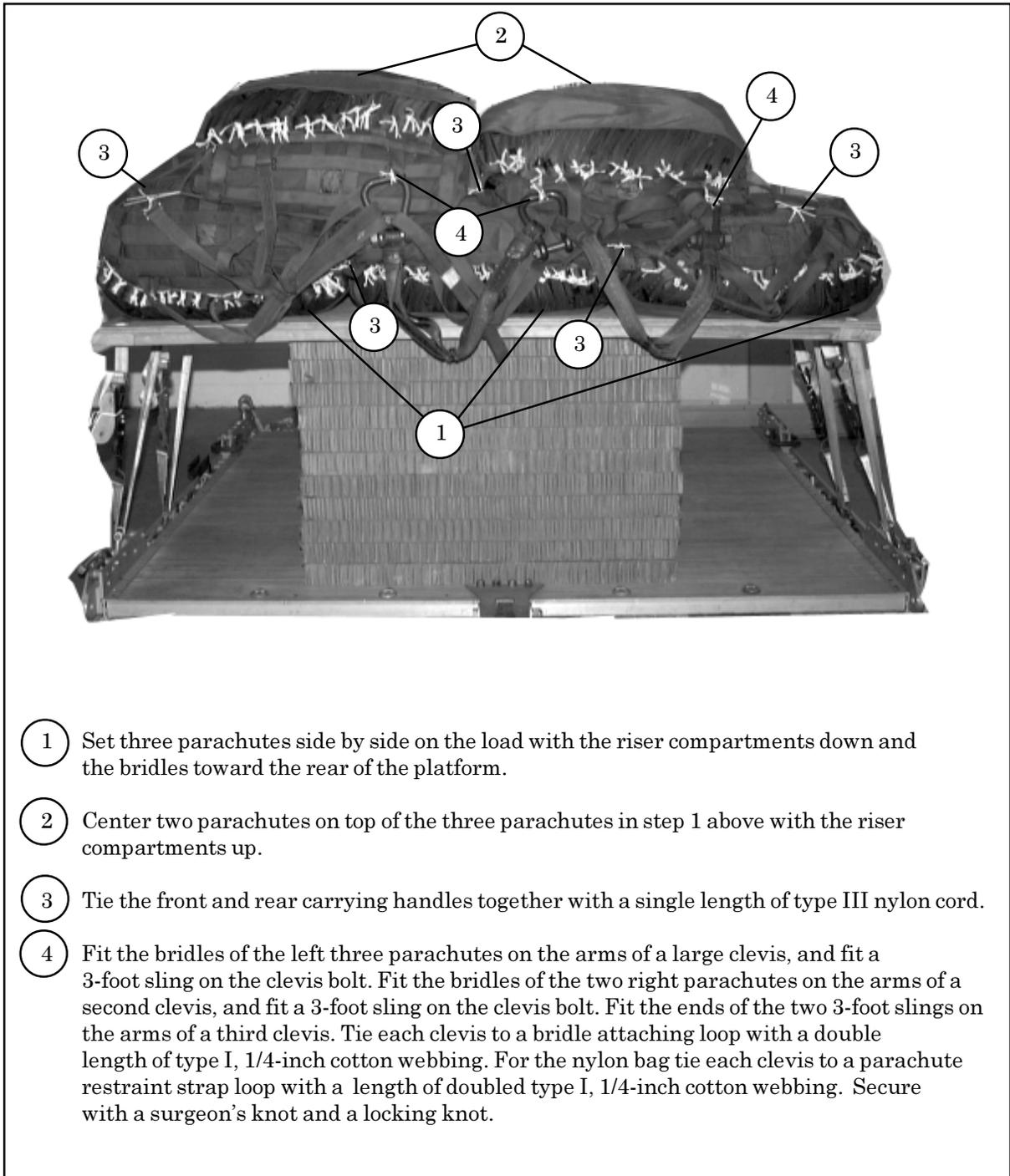


- 1 Set two parachutes side by side on the load with the riser compartments down and the bridles toward the rear of the platform.
- 2 Center one parachute on top of the two parachutes in step 1 above with the riser compartment up.
- 3 Tie the front and rear carrying handles together with a single length of type III nylon cord.
- 4 Fit the bridle loops on the arms of a large clevis.
- 5 For the nylon bag tie the clevis to the top right parachute restraint strap loop with a length of doubled type I, 1/4-inch cotton webbing. Secure with a surgeon's knot and a locking knot. For the cotton bag tie the clevis to the top right bridle attaching loop with a length of doubled type I, 1/4-inch cotton webbing. Secure with a surgeon's knot and a locking knot.

**Figure 3-22. Three Parachutes Stowed**

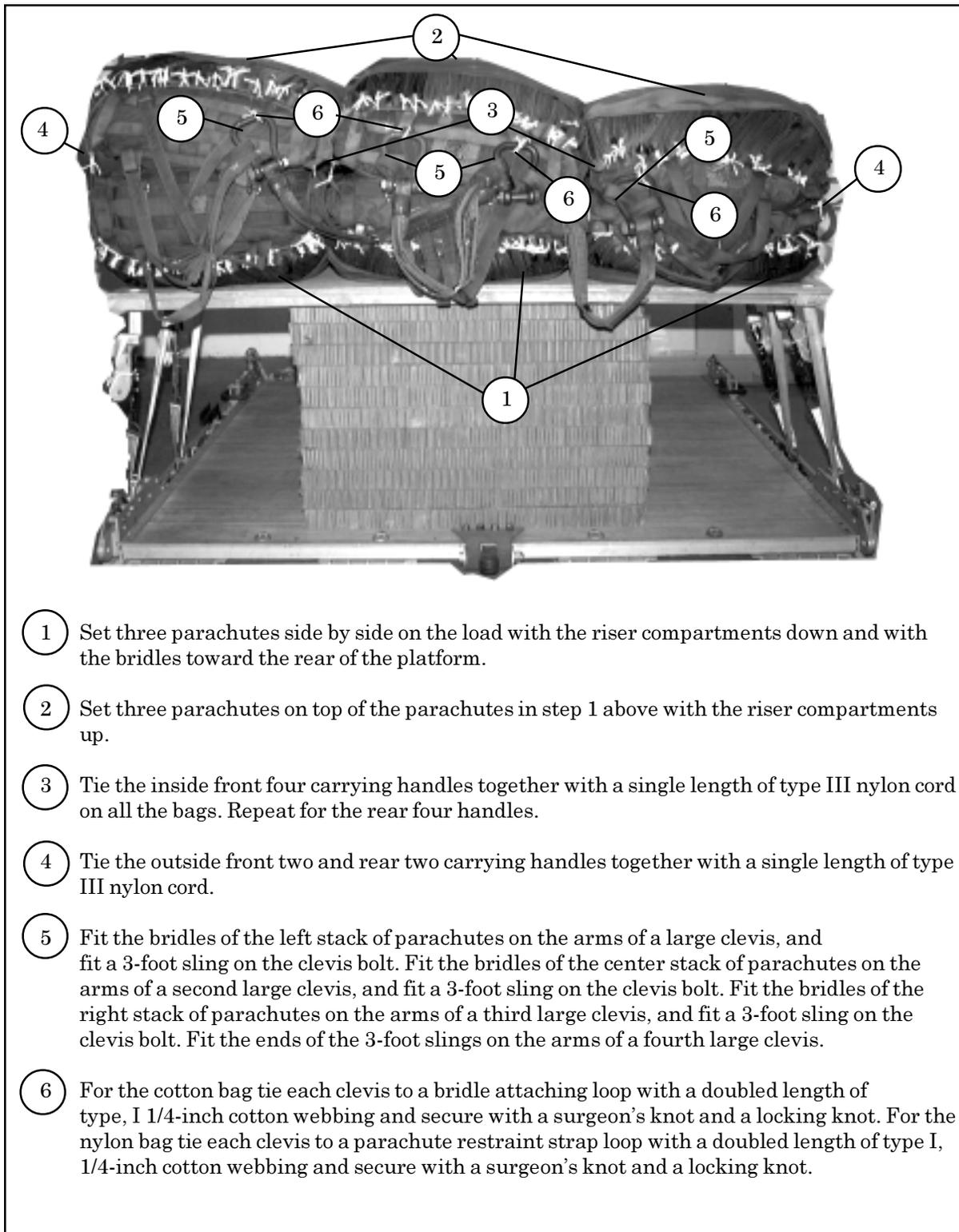


**Figure 3-23. Four Parachutes Stowed**



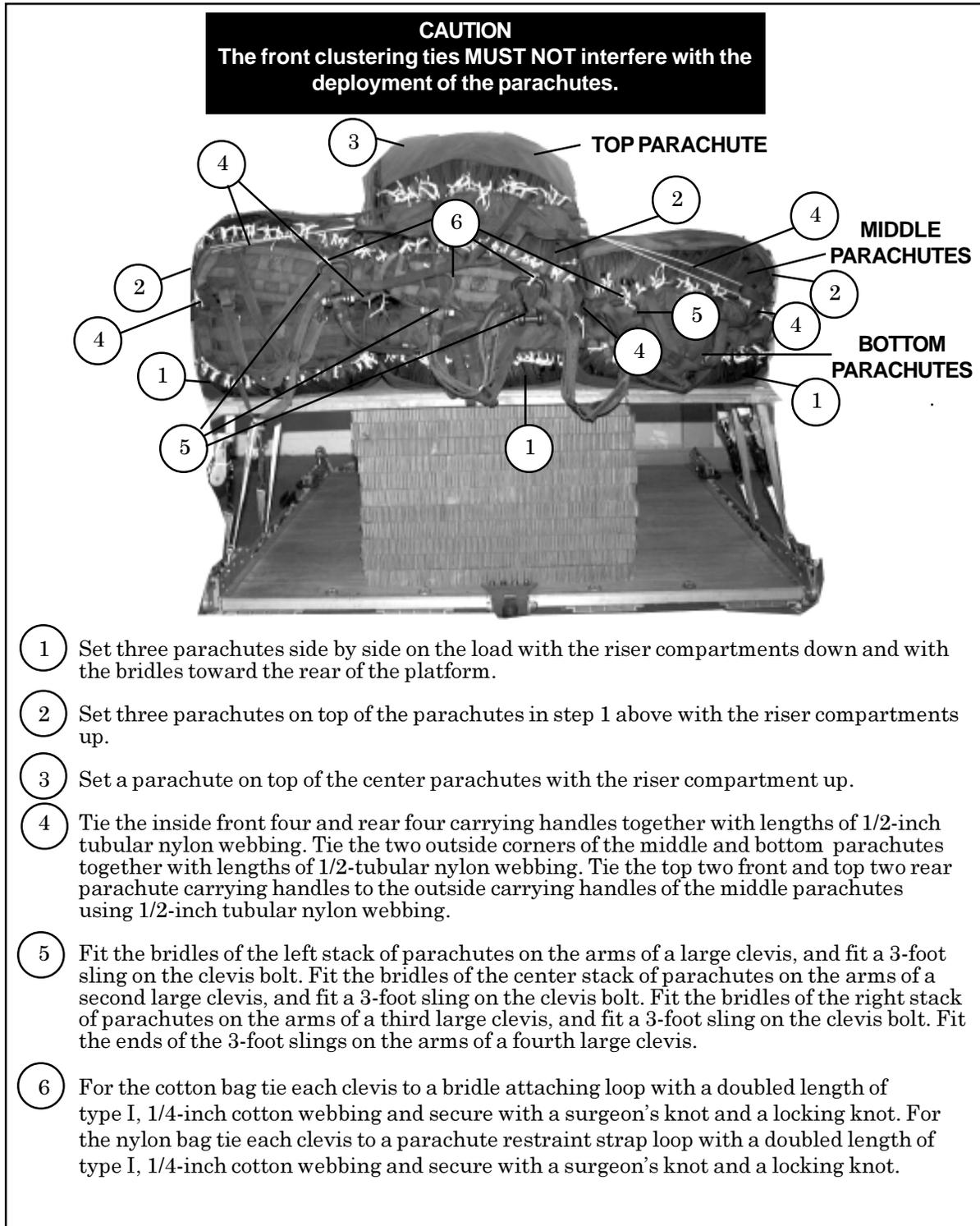
- 1 Set three parachutes side by side on the load with the riser compartments down and the bridles toward the rear of the platform.
- 2 Center two parachutes on top of the three parachutes in step 1 above with the riser compartments up.
- 3 Tie the front and rear carrying handles together with a single length of type III nylon cord.
- 4 Fit the bridles of the left three parachutes on the arms of a large clevis, and fit a 3-foot sling on the clevis bolt. Fit the bridles of the two right parachutes on the arms of a second clevis, and fit a 3-foot sling on the clevis bolt. Fit the ends of the two 3-foot slings on the arms of a third clevis. Tie each clevis to a bridle attaching loop with a double length of type I, 1/4-inch cotton webbing. For the nylon bag tie each clevis to a parachute restraint strap loop with a length of doubled type I, 1/4-inch cotton webbing. Secure with a surgeon's knot and a locking knot.

**Figure 3-24. Five Parachutes Stowed**



- 1 Set three parachutes side by side on the load with the riser compartments down and with the bridles toward the rear of the platform.
- 2 Set three parachutes on top of the parachutes in step 1 above with the riser compartments up.
- 3 Tie the inside front four carrying handles together with a single length of type III nylon cord on all the bags. Repeat for the rear four handles.
- 4 Tie the outside front two and rear two carrying handles together with a single length of type III nylon cord.
- 5 Fit the bridles of the left stack of parachutes on the arms of a large clevis, and fit a 3-foot sling on the clevis bolt. Fit the bridles of the center stack of parachutes on the arms of a second large clevis, and fit a 3-foot sling on the clevis bolt. Fit the bridles of the right stack of parachutes on the arms of a third large clevis, and fit a 3-foot sling on the clevis bolt. Fit the ends of the 3-foot slings on the arms of a fourth large clevis.
- 6 For the cotton bag tie each clevis to a bridle attaching loop with a doubled length of type, I 1/4-inch cotton webbing and secure with a surgeon's knot and a locking knot. For the nylon bag tie each clevis to a parachute restraint strap loop with a doubled length of type I, 1/4-inch cotton webbing and secure with a surgeon's knot and a locking knot.

**Figure 3-25. Six Parachutes Stowed**



**Figure 3-26. Seven Parachutes Stowed**

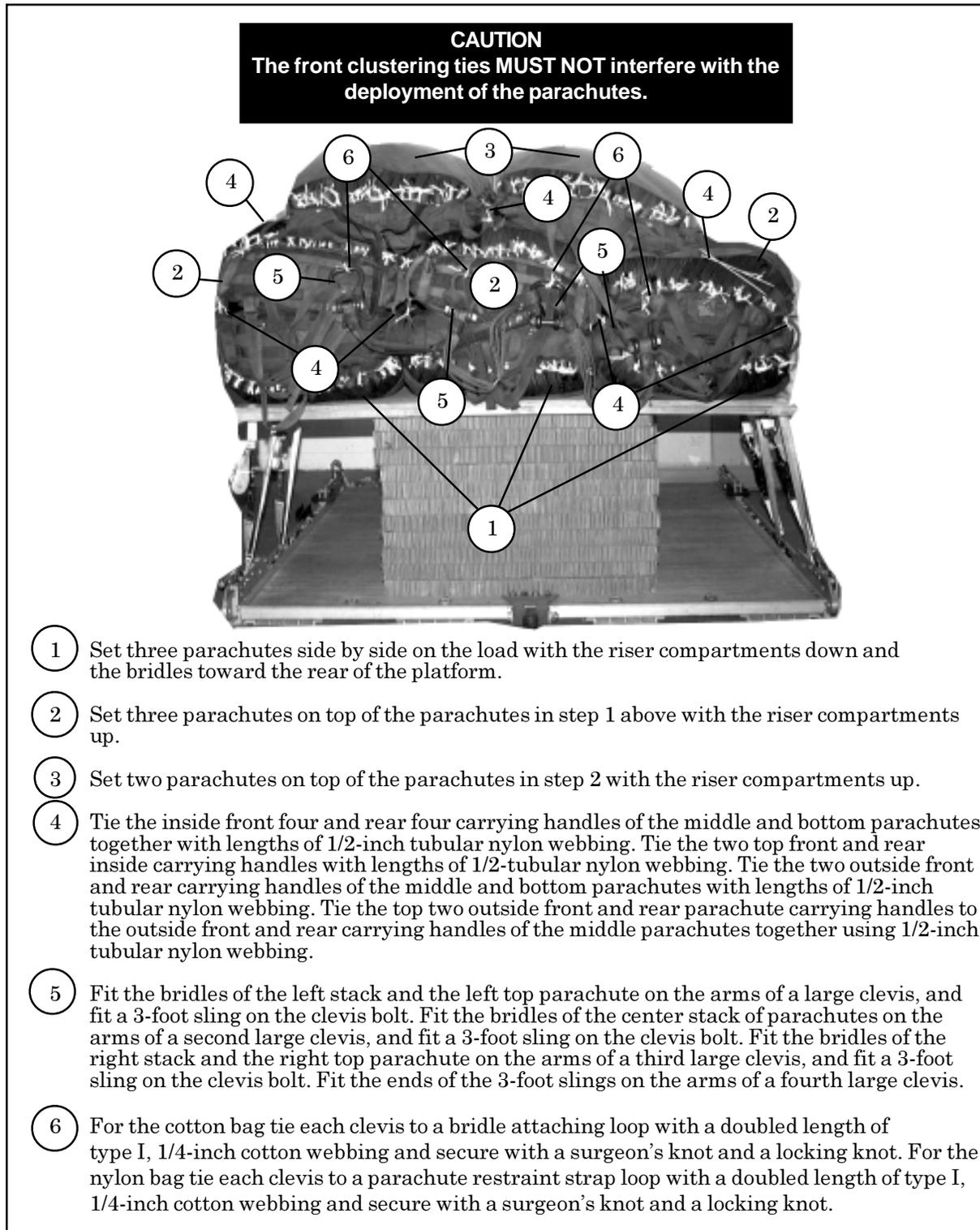
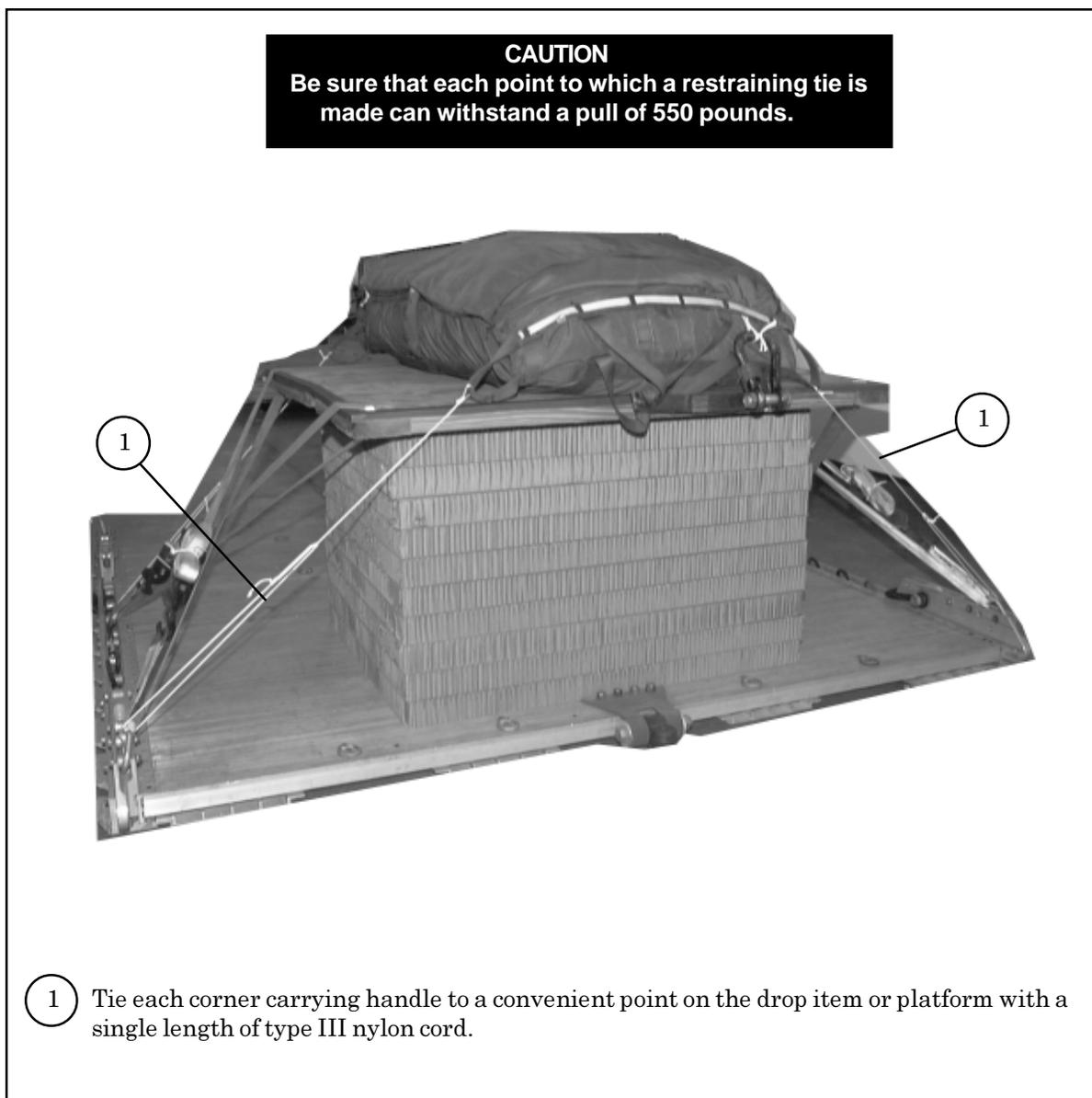


Figure 3-27. Eight Parachutes Stowed

## RESTRAINING ONE PARACHUTE

3-20. Restrain one cargo parachute as shown in Figure 3-28.



**Figure 3-28. One Parachute Restrained**

## RESTRAINING TWO TO EIGHT PARACHUTES

3-21. The following parachute restraint systems are used to restrain two to eight cargo parachutes.

*a. Two Parachutes.* The restraint system for two cargo parachutes consists of one length of type VIII nylon webbing (restraint strap) and one V-knife as shown in Figures 3-29 and 3-30 or one guillotine-knife parachute release strap shown in Figures 3-31 and 3-32. Restrain two cargo parachutes as shown in Figures 3-29 through 3-36.

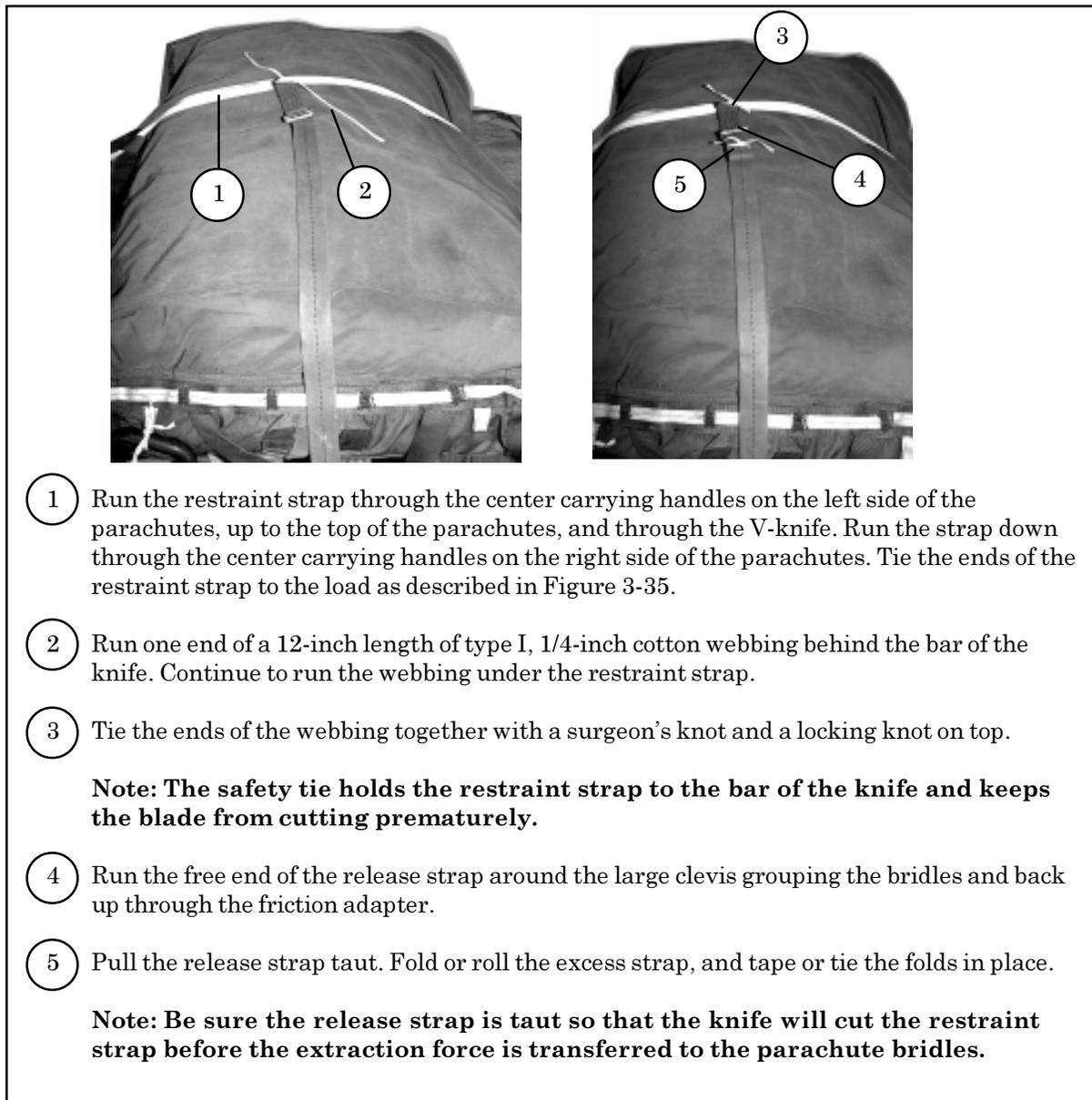
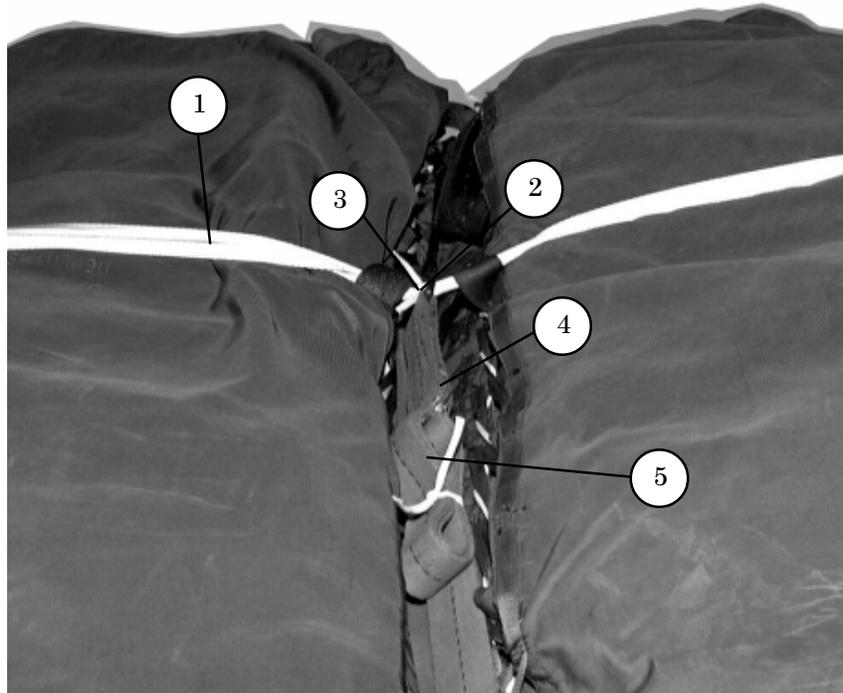


Figure 3-29. V-knife Parachute Release Strap Installed on Loads with Two Stacked Parachutes



- 1 Run the restraint strap through the center carrying handle on the left side of the parachute. Run the restraint strap over the top of the parachute, and down through the left center carrying handle and through the V-knife. Continue to run the restraint strap up through the right inside carrying handle. Run the restraint strap over the right parachute and down through the right outside carrying handle. Tie the ends of the restraint strap to the load as described in Figure 3-35.

- 2 Run one end of a 12-inch length of type I, 1/4-inch cotton webbing behind the bar of the knife. Continue to run the webbing under the restraint strap.

- 3 Tie the ends of the webbing together with a surgeon's knot and a locking knot on top.

**Note: The safety tie holds the restraint strap to the bar of the knife and keeps the blade from cutting prematurely.**

- 4 Run the free end of the release strap around the large clevis grouping the bridles and back up through the friction adapter.

- 5 Pull the release strap taut. Fold or roll the excess strap, and tape or tie the folds in place.

**Note: Be sure the release strap is taut so that the knife will cut the restraint strap before the extraction force is transferred to the parachute bridles.**

**Figure 3-30. V-knife Parachute Release Strap Installed on Loads with Two Side-by Side Parachutes**

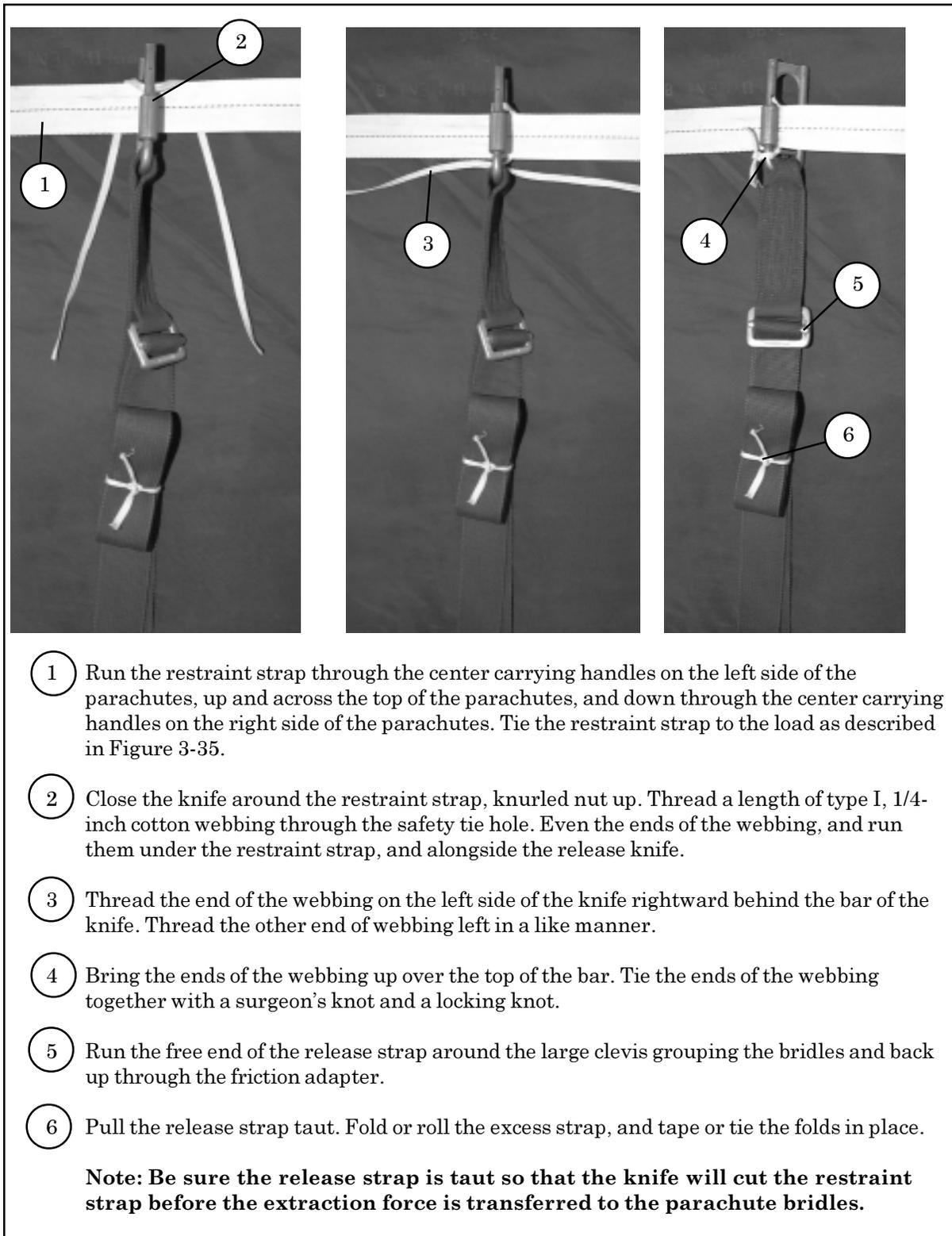
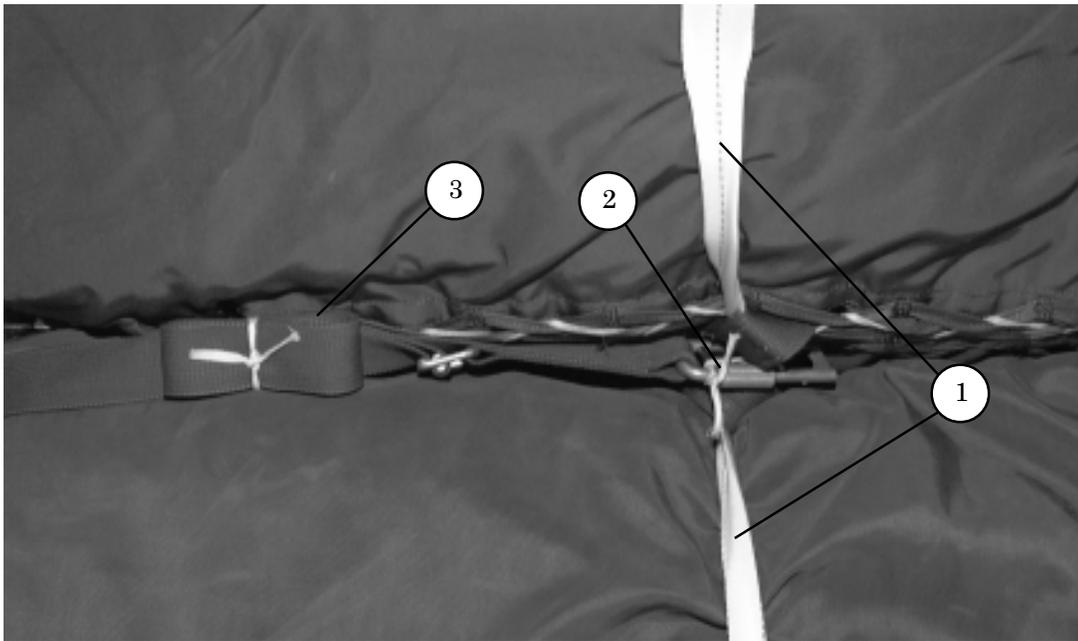


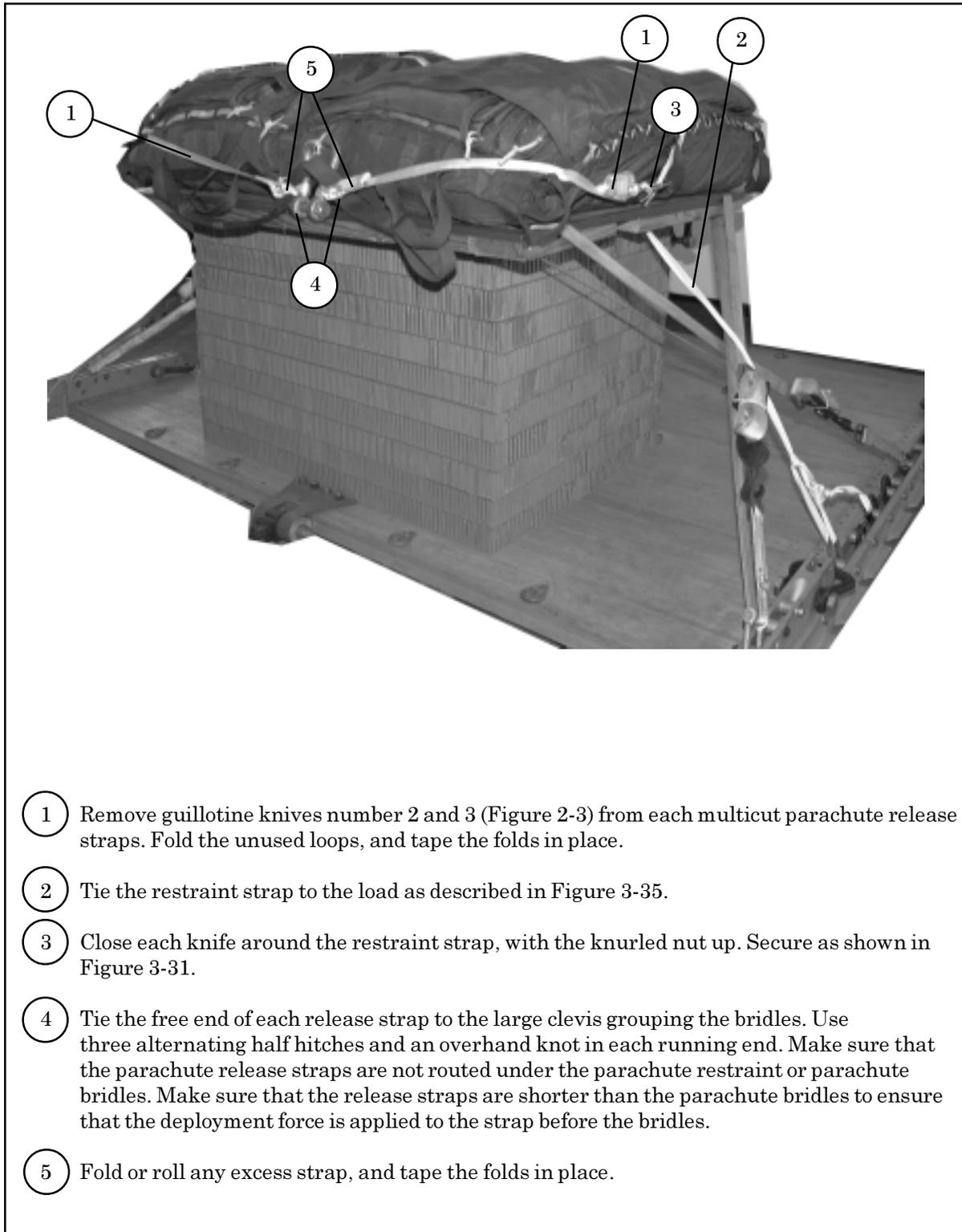
Figure 3-31. Guillotine-knife Parachute Release Strap Installed on Two Stacked Parachutes



- 1 Run the restraint strap up through the outside carrying handle of the left parachute, across the left parachute, down through the inside center carrying handle of the left parachute, up through the inside center carrying handle of the right parachute, across the right parachute, and down through the outside center carrying handle of the right parachute. Tie the restraint strap to the load as described in Figure 3-35.
- 2 Close the knife around the restraint strap with the knurled nut up, between the inside carrying handles. Thread a length of type I, 1/4-inch cotton webbing through the safety tie hole. Even the ends of the webbing, and run them under the restraint strap, and along side the release knife. Thread the end of the webbing on the left of the knife rightward behind the bar of the knife. Thread the other end of webbing leftward in a like manner. Bring the ends of the webbing up over the top of the bar. Tie the ends of the webbing together with a surgeon's knot and locking knot as shown in Figure 3-31. Run the free end of the release strap down through the large clevis grouping the bridles and back up through the friction adapter as described in Figure 3-31.
- 3 Pull the release strap taut. Fold or roll the excess strap, and tape or tie the folds in place as described in Figure 3-31.

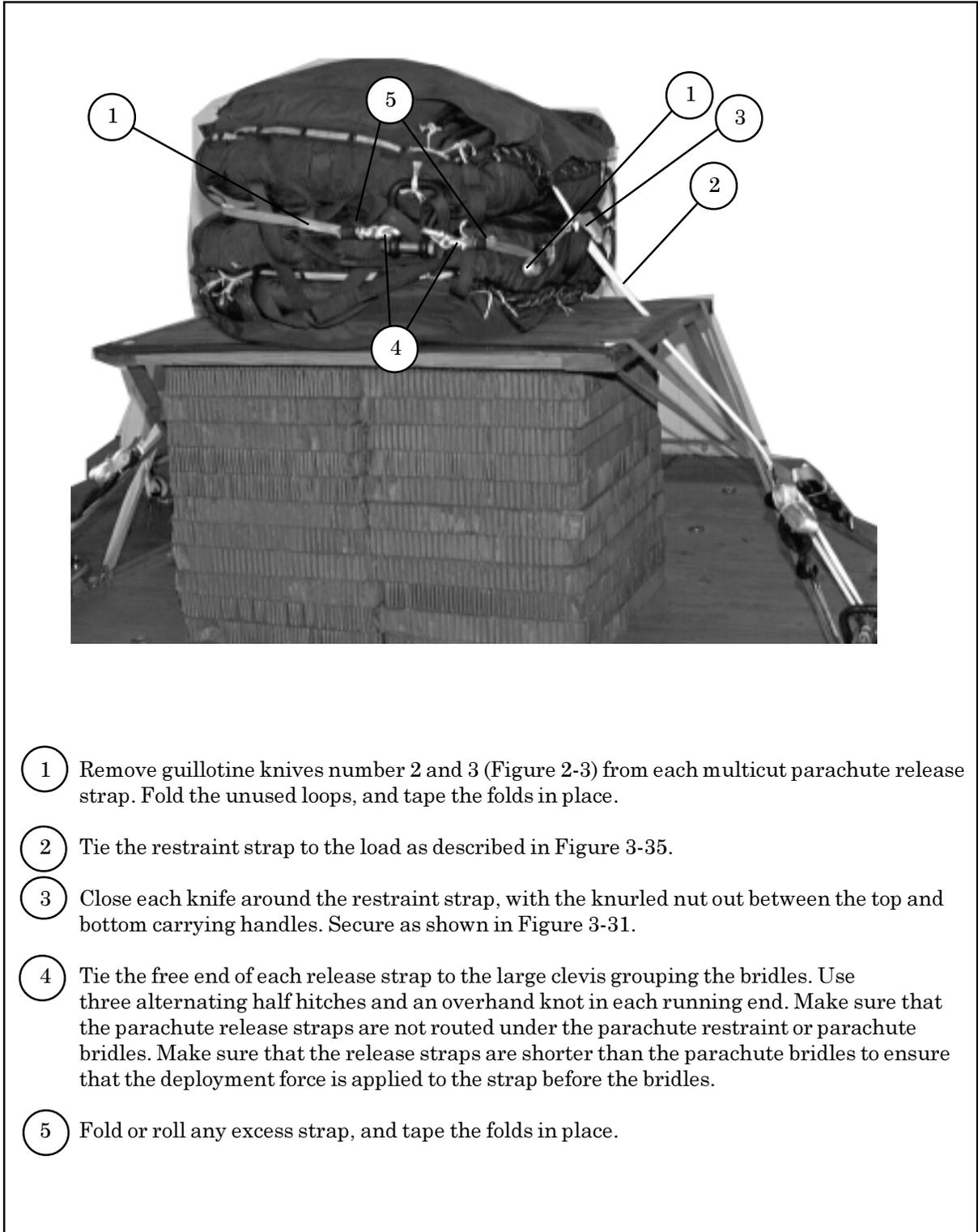
**Note:** Be sure the release strap is taut so that the knife will cut the restraint strap before the extraction force is transferred to the parachute bridles.

**Figure 3-32. Guillotine-knife Parachute Release Strap Installed on Two Side-by-Side Parachutes**



- 1 Remove guillotine knives number 2 and 3 (Figure 2-3) from each multicut parachute release straps. Fold the unused loops, and tape the folds in place.
- 2 Tie the restraint strap to the load as described in Figure 3-35.
- 3 Close each knife around the restraint strap, with the knurled nut up. Secure as shown in Figure 3-31.
- 4 Tie the free end of each release strap to the large clevis grouping the bridles. Use three alternating half hitches and an overhand knot in each running end. Make sure that the parachute release straps are not routed under the parachute restraint or parachute bridles. Make sure that the release straps are shorter than the parachute bridles to ensure that the deployment force is applied to the strap before the bridles.
- 5 Fold or roll any excess strap, and tape the folds in place.

**Figure 3-33. Multicut Parachute Release Straps Installed on Two Side-by-Side Parachutes**



- 1 Remove guillotine knives number 2 and 3 (Figure 2-3) from each multicut parachute release strap. Fold the unused loops, and tape the folds in place.
- 2 Tie the restraint strap to the load as described in Figure 3-35.
- 3 Close each knife around the restraint strap, with the knurled nut out between the top and bottom carrying handles. Secure as shown in Figure 3-31.
- 4 Tie the free end of each release strap to the large clevis grouping the bridles. Use three alternating half hitches and an overhand knot in each running end. Make sure that the parachute release straps are not routed under the parachute restraint or parachute bridles. Make sure that the release straps are shorter than the parachute bridles to ensure that the deployment force is applied to the strap before the bridles.
- 5 Fold or roll any excess strap, and tape the folds in place.

**Figure 3-34. Multicut Parachute Release Straps Installed on Two Stacked Parachutes**

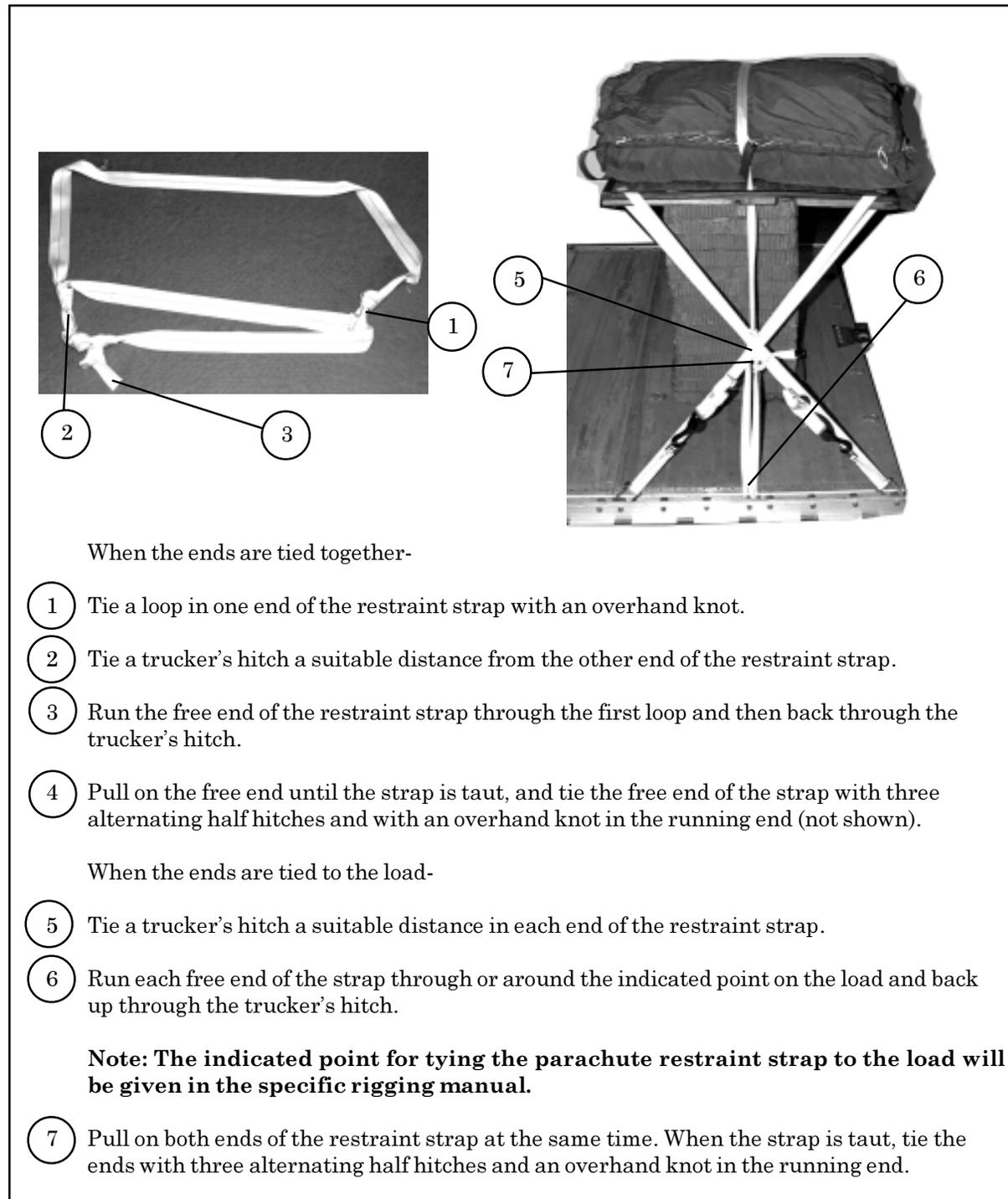


Figure 3-35. Restraint Strap Tied

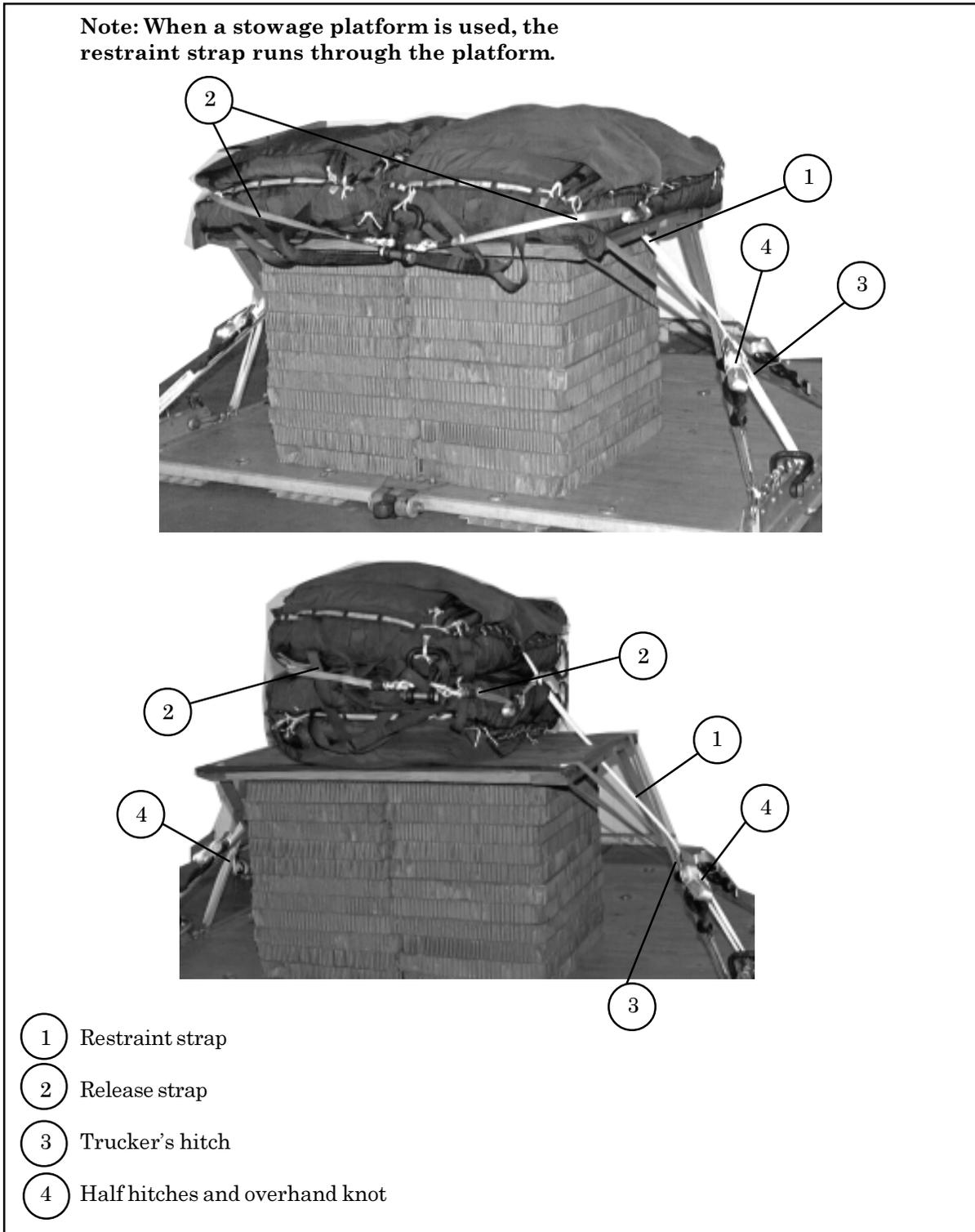
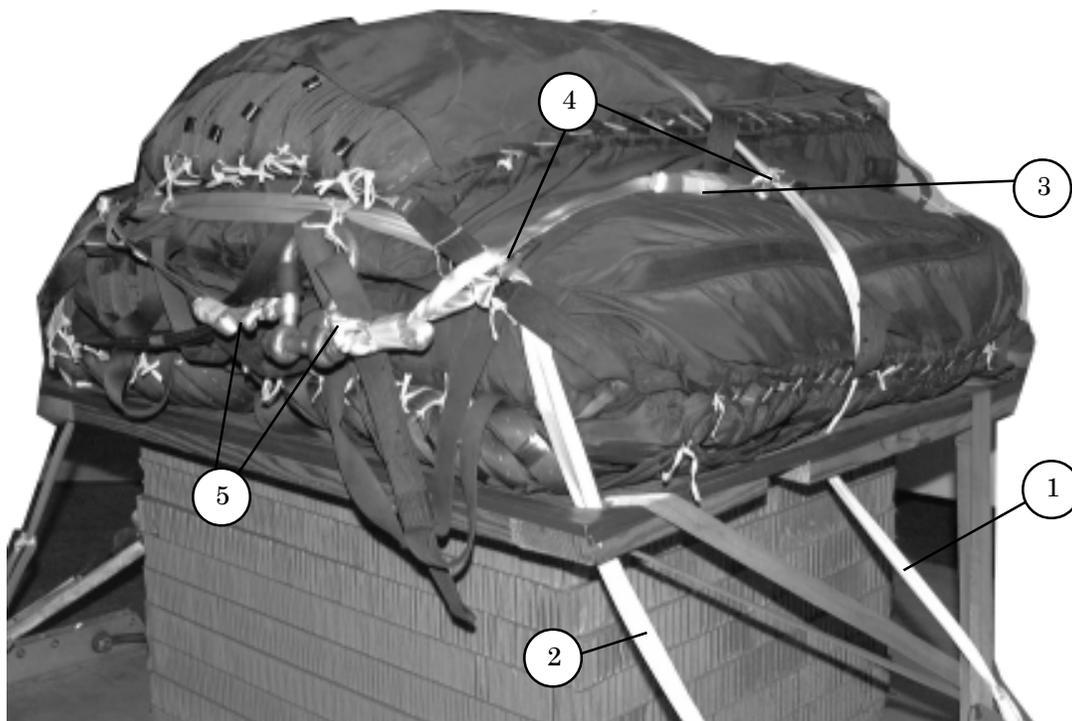


Figure 3-36. Two Parachutes Restrained

**b. Three to Five Parachutes.** The restraint system for three to five cargo parachutes consists of two lengths of type VIII nylon webbing (restraint strap) and two multicut parachute release straps. Restrain three to five cargo parachutes as shown in Figures 3-37 through 3-39.

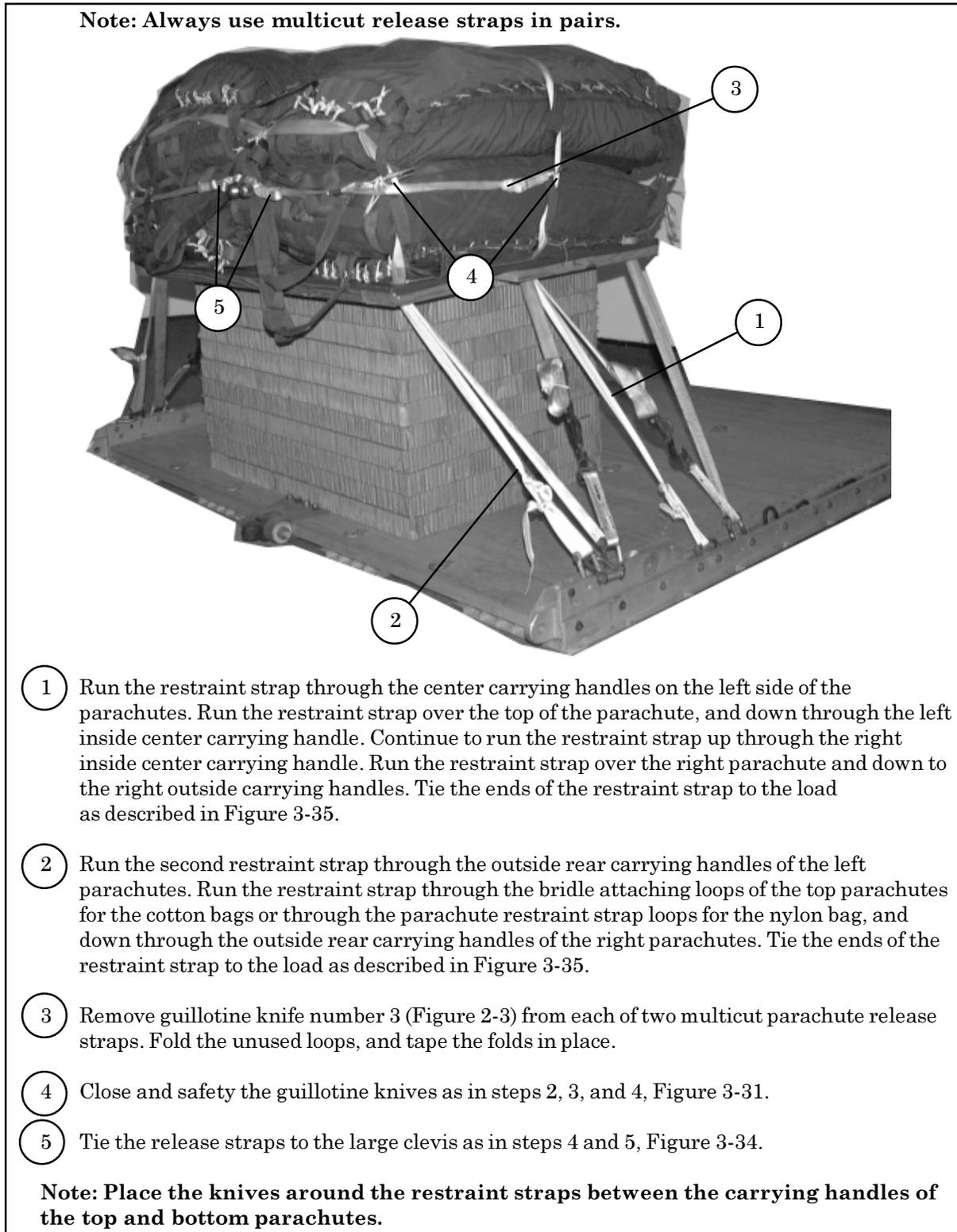
**Note: Always use multicut parachute release straps in pairs.**



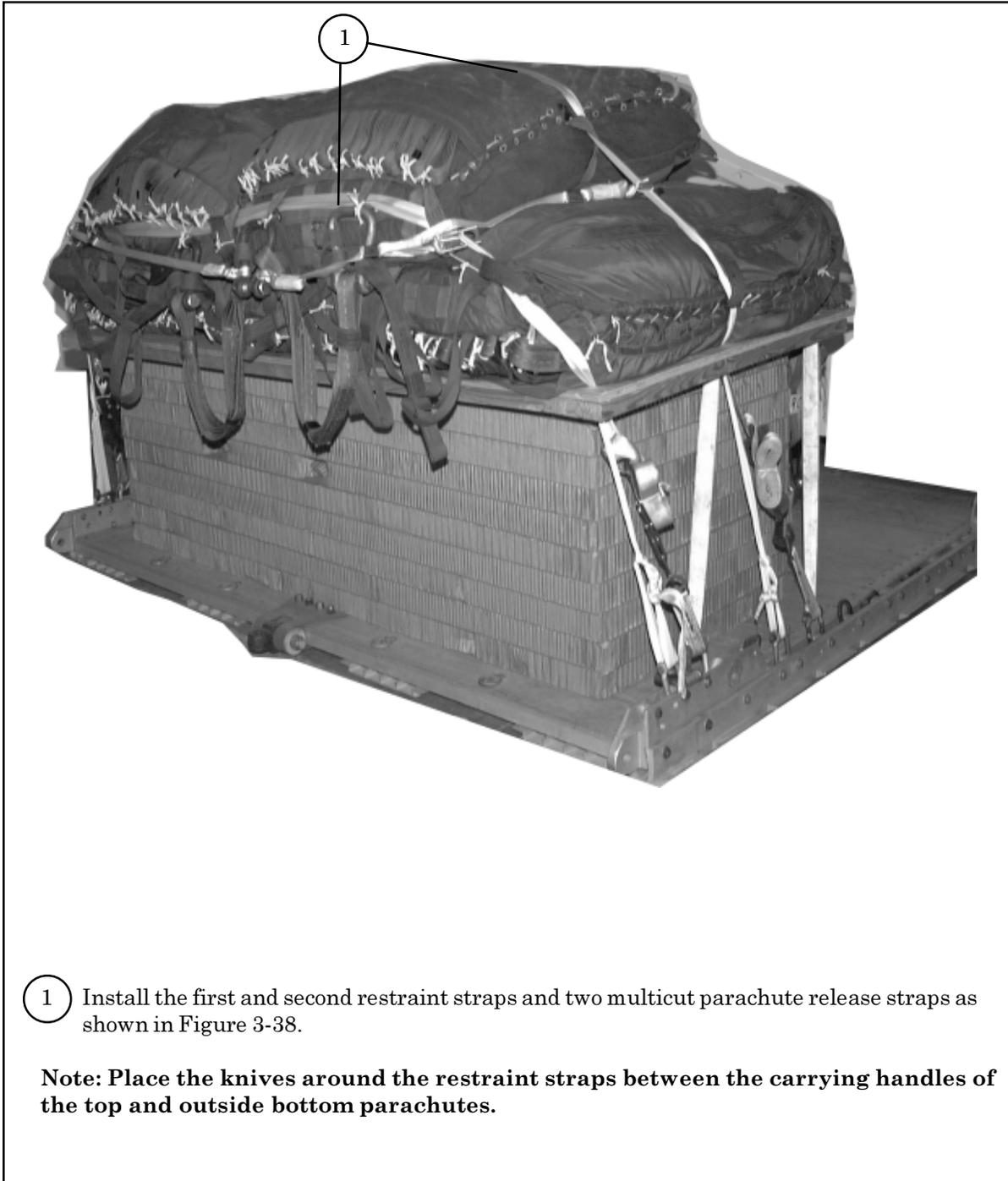
- 1 Install the first restraint strap as described in step 1, Figure 3-31.
- 2 Run the second restraint strap through the outside rear carrying handle of the bottom left parachute, up through the top left rear carrying handle and both bridle attaching loops of the top parachute for the cotton bags or through the parachute restraint strap loops for the nylon bag, and down through the outside rear carrying handles of the top and bottom right parachute. Tie the restraint strap to the load as described in Figure 3-35.
- 3 Remove guillotine knife number 3 (Figure 2-3) from each of two multicut parachute release straps. Fold the unused loops, and tape the folds in place.
- 4 Close and safety the guillotine knives as in steps 2, 3, and 4, Figure 3-31.
- 5 Tie the release straps to the large clevis as in steps 4 and 5, Figure 3-34.

**Note: Place the knives around the restraint straps between the carrying handles of the top and bottom parachutes.**

**Figure 3-37. Three Parachutes Restrained Using Multicut Release Straps**

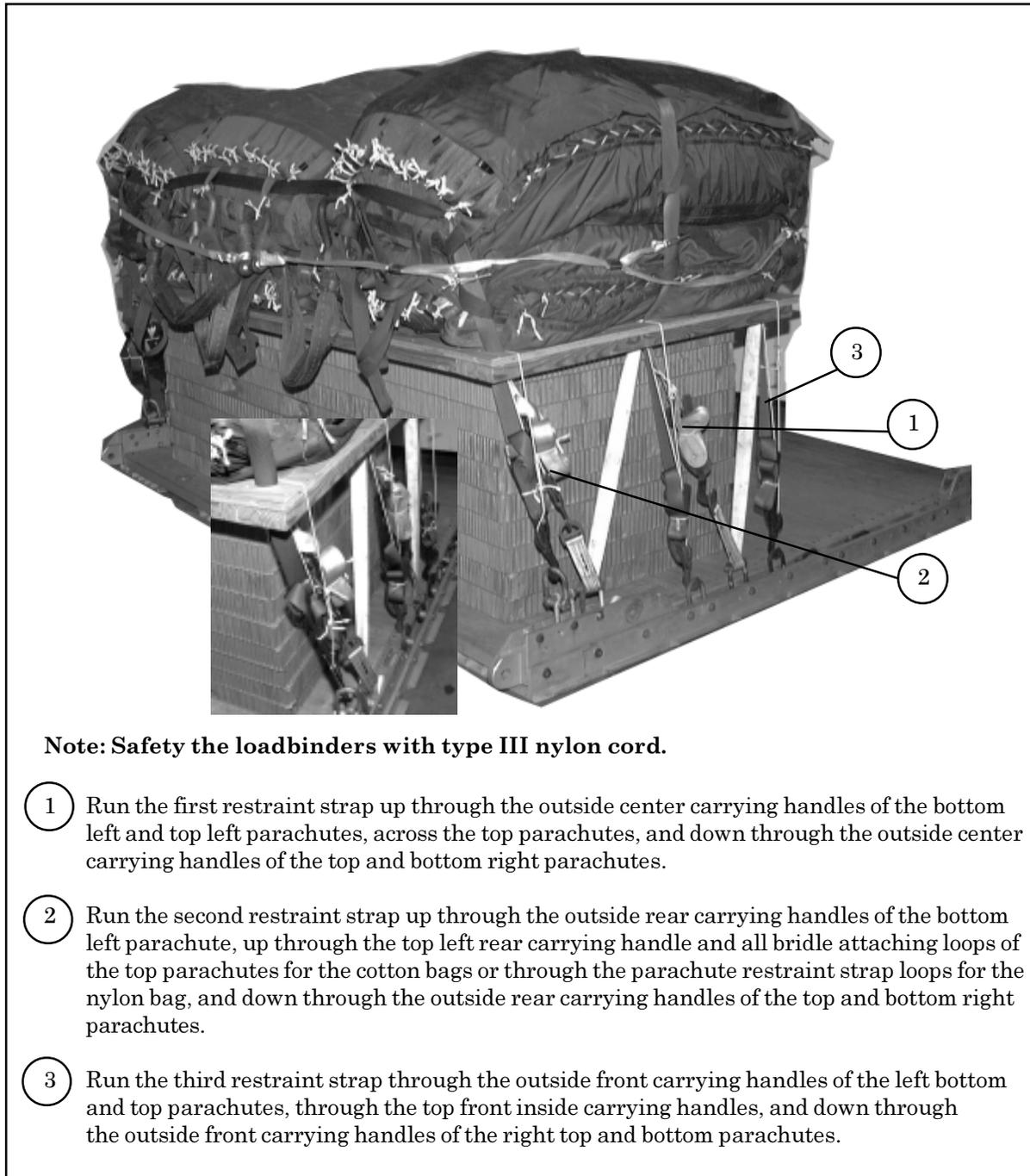


**Figure 3-38. Four Parachutes Restrained Using Multicut Parachute Release Straps**

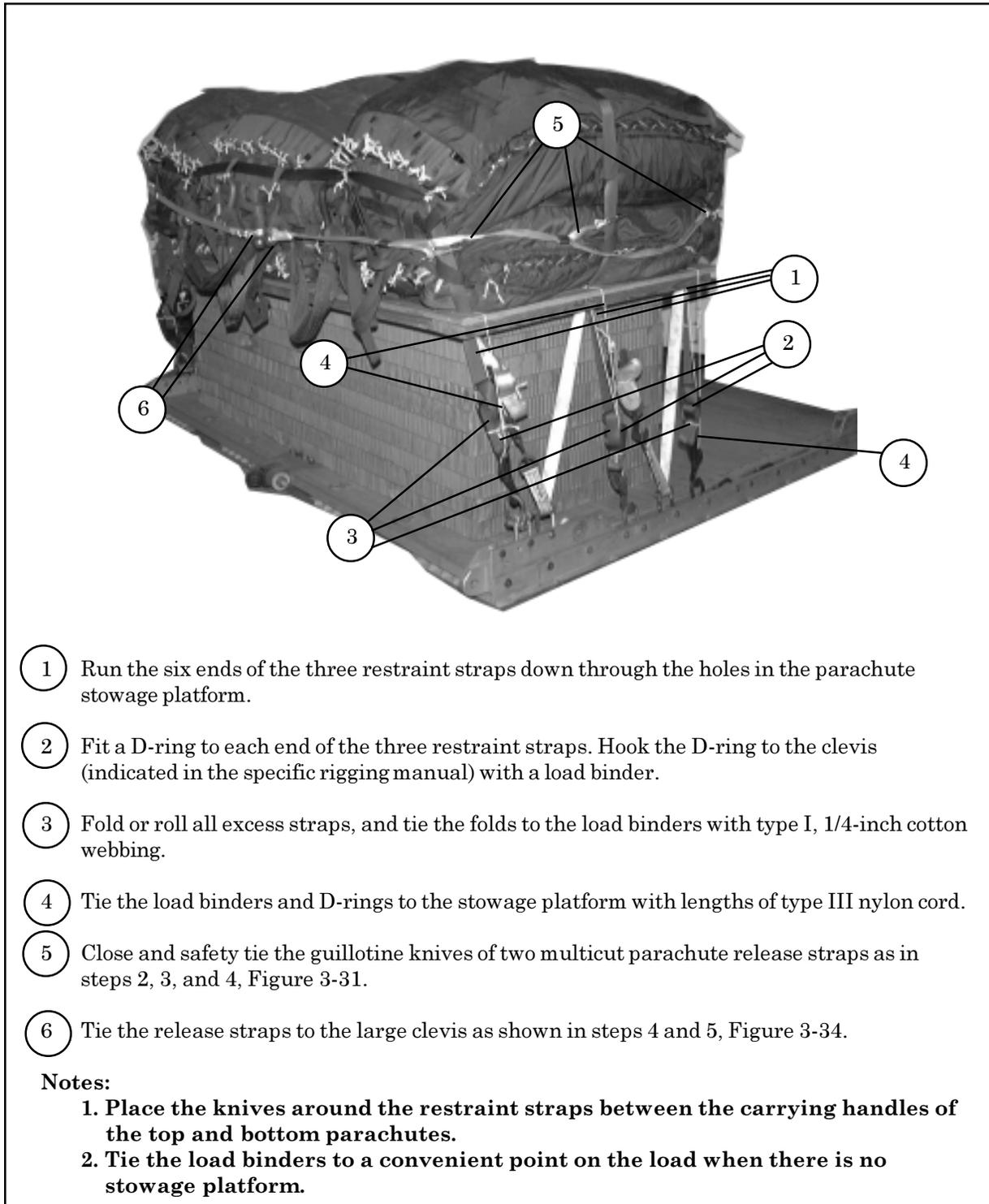


**Figure 3-39. Five Parachutes Restrained Using Multicut Parachute Release Straps**

*c. Six, Seven, or Eight Parachutes.* The restraint system for six, seven, or eight cargo parachutes consists of three type X restraint straps, two multicut parachute release straps, six D-rings, and six load binders. Restrain six, seven, or eight cargo parachutes as shown in Figures 3-40 through 3-43.



**Figure 3-40. Six Parachutes Restrained**

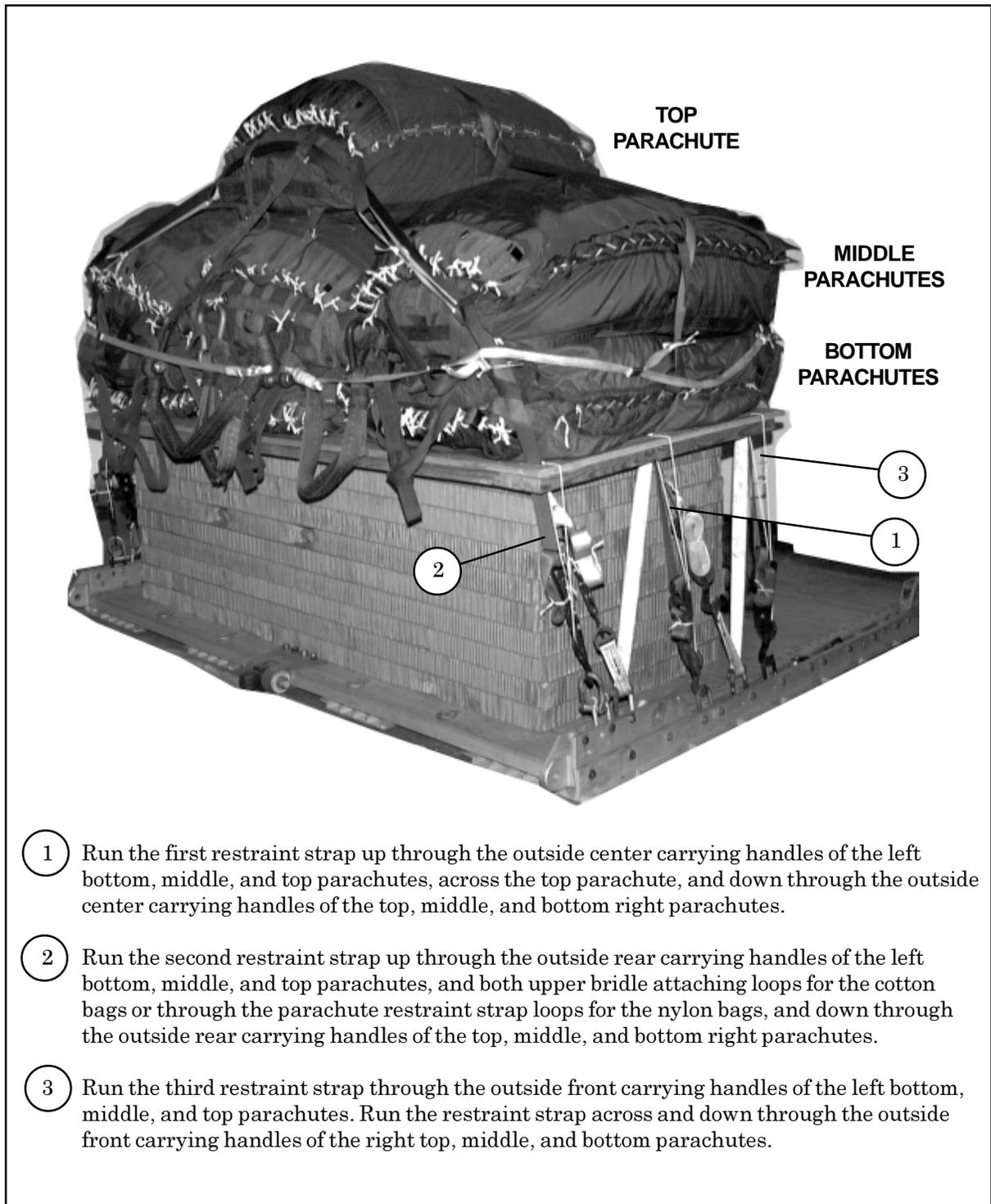


- 1 Run the six ends of the three restraint straps down through the holes in the parachute stowage platform.
- 2 Fit a D-ring to each end of the three restraint straps. Hook the D-ring to the clevis (indicated in the specific rigging manual) with a load binder.
- 3 Fold or roll all excess straps, and tie the folds to the load binders with type I, 1/4-inch cotton webbing.
- 4 Tie the load binders and D-rings to the stowage platform with lengths of type III nylon cord.
- 5 Close and safety tie the guillotine knives of two multicut parachute release straps as in steps 2, 3, and 4, Figure 3-31.
- 6 Tie the release straps to the large clevis as shown in steps 4 and 5, Figure 3-34.

**Notes:**

1. Place the knives around the restraint straps between the carrying handles of the top and bottom parachutes.
2. Tie the load binders to a convenient point on the load when there is no stowage platform.

**Figure 3-41. Six Parachutes Restrained Using Multicut Parachute Release Straps**



**Figure 3-42. Seven Parachutes Restrained**

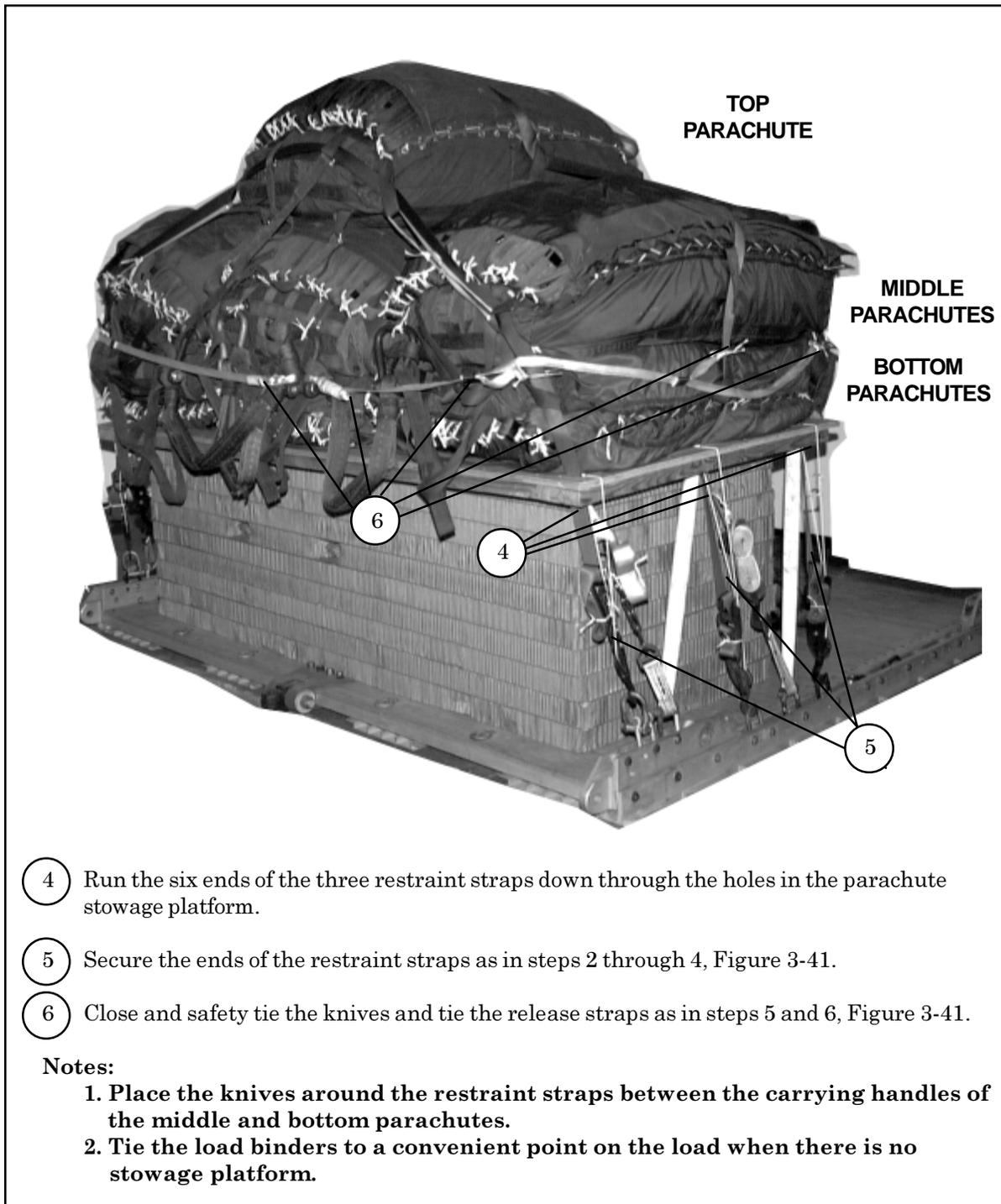
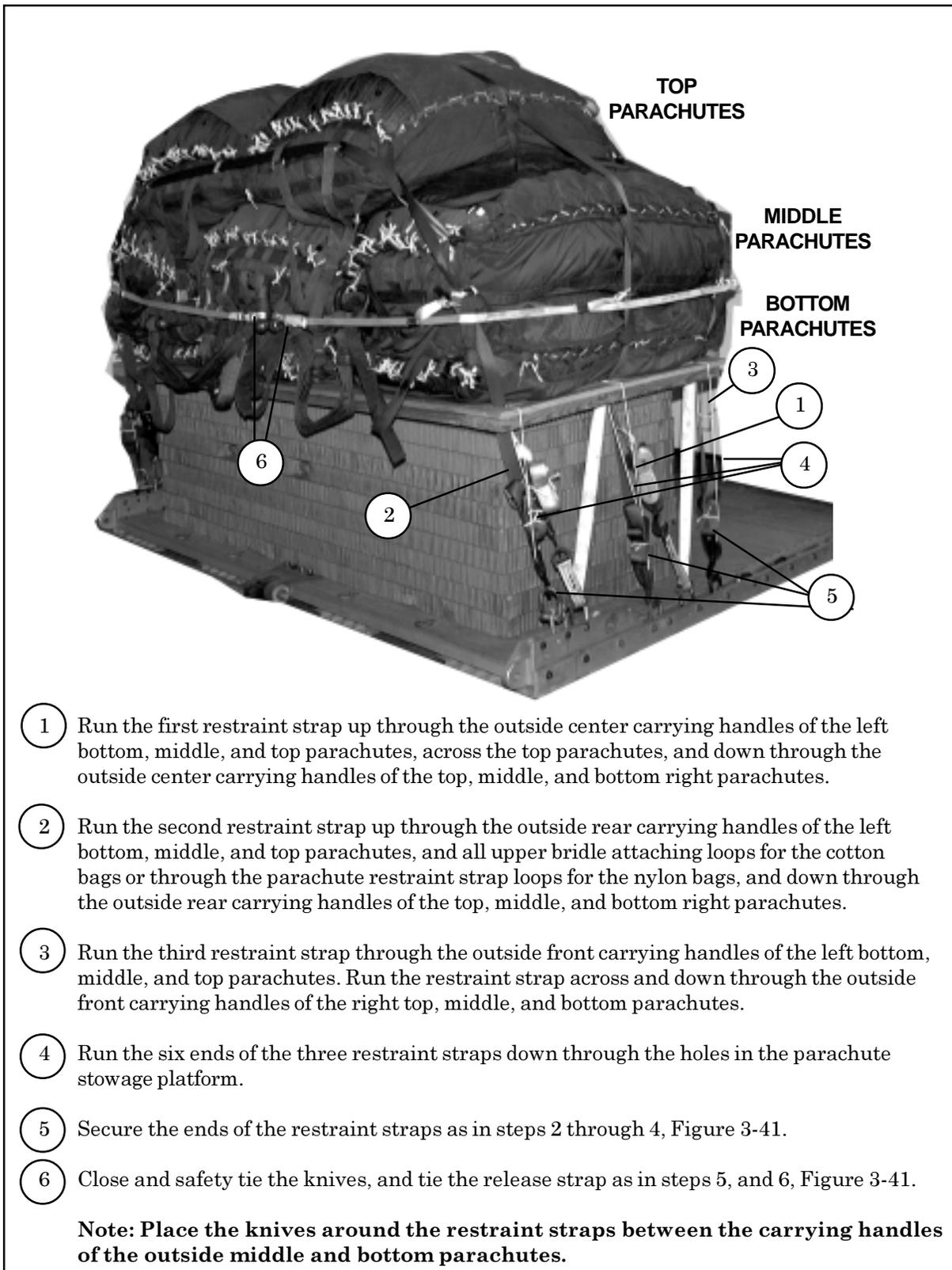


Figure 3-42. Seven Parachutes Restrained (Continued)



- 1 Run the first restraint strap up through the outside center carrying handles of the left bottom, middle, and top parachutes, across the top parachutes, and down through the outside center carrying handles of the top, middle, and bottom right parachutes.
- 2 Run the second restraint strap up through the outside rear carrying handles of the left bottom, middle, and top parachutes, and all upper bridle attaching loops for the cotton bags or through the parachute restraint strap loops for the nylon bags, and down through the outside rear carrying handles of the top, middle, and bottom right parachutes.
- 3 Run the third restraint strap through the outside front carrying handles of the left bottom, middle, and top parachutes. Run the restraint strap across and down through the outside front carrying handles of the right top, middle, and bottom parachutes.
- 4 Run the six ends of the three restraint straps down through the holes in the parachute stowage platform.
- 5 Secure the ends of the restraint straps as in steps 2 through 4, Figure 3-41.
- 6 Close and safety tie the knives, and tie the release strap as in steps 5, and 6, Figure 3-41.

**Note: Place the knives around the restraint straps between the carrying handles of the outside middle and bottom parachutes.**

**Figure 3-43. Eight Parachutes Restrained**

Section V

## Extraction System

### EXTRACTION FORCE TRANSFER COUPLING

3-22. Inspect, maintain, and test the components of the EFTC extraction system as outlined in TM 10-1670-296-20&P/TO 13C7-49-2 and this manual.

*a. Inspecting and Assembling Components.* Before each use, inspect and assemble the components of the EFTC extraction system as follows:

(1) Inspect the components according to TM 10-1670-296-20&P/TO 13C7-49-2.

(2) Assemble the EFTC extraction system as shown in Figures 3-44 through 3-48.

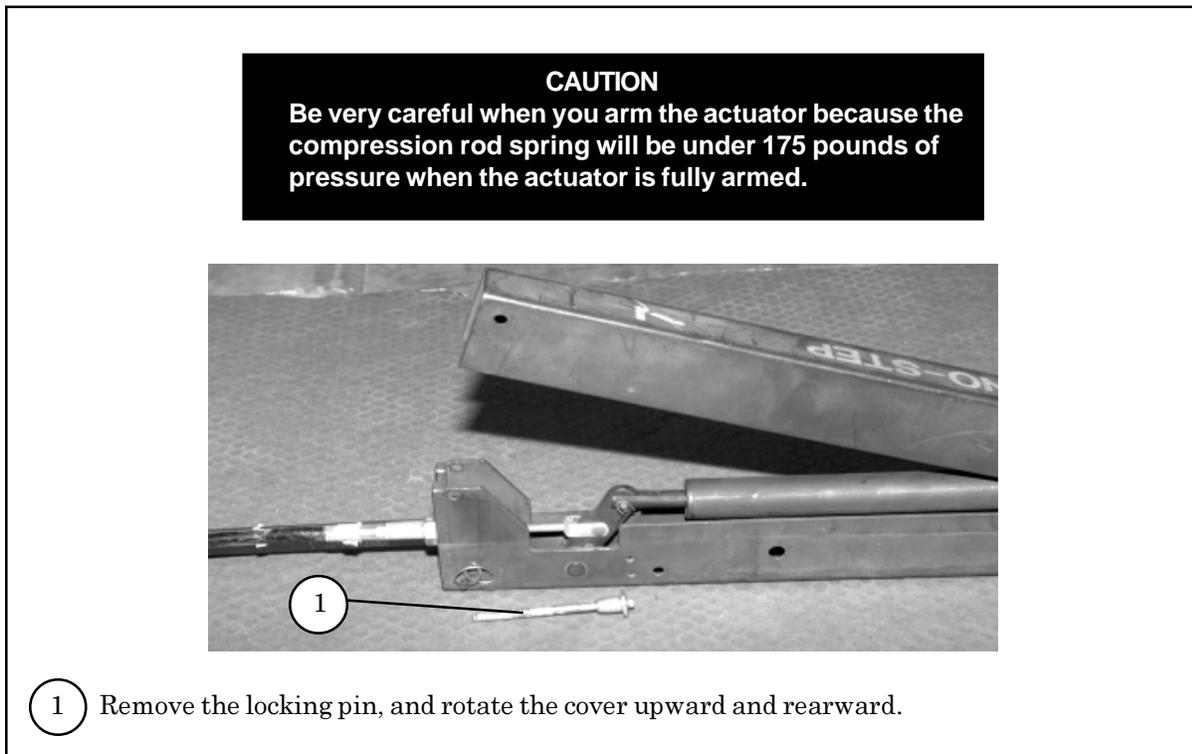


Figure 3-44. Locking Pin Removed

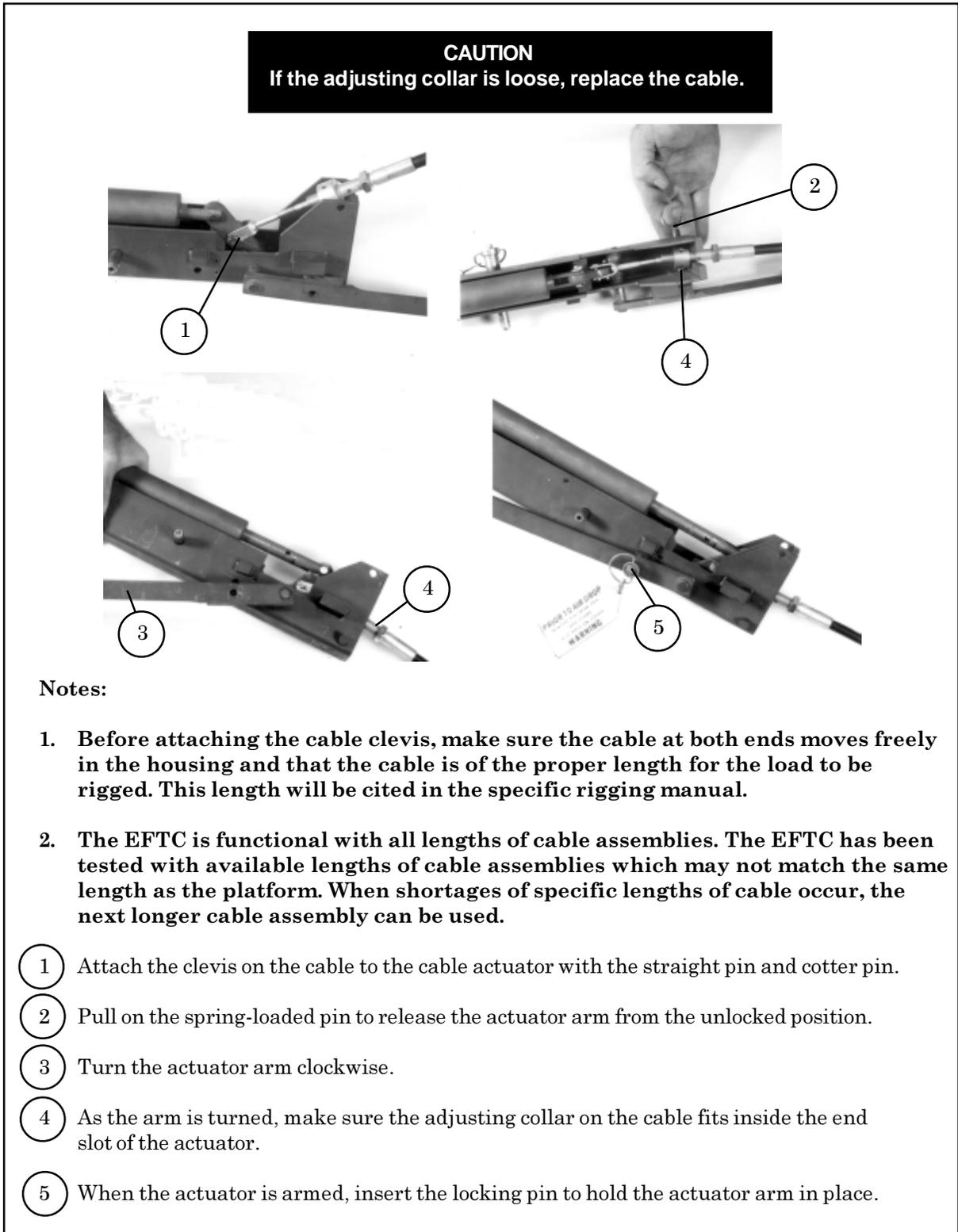
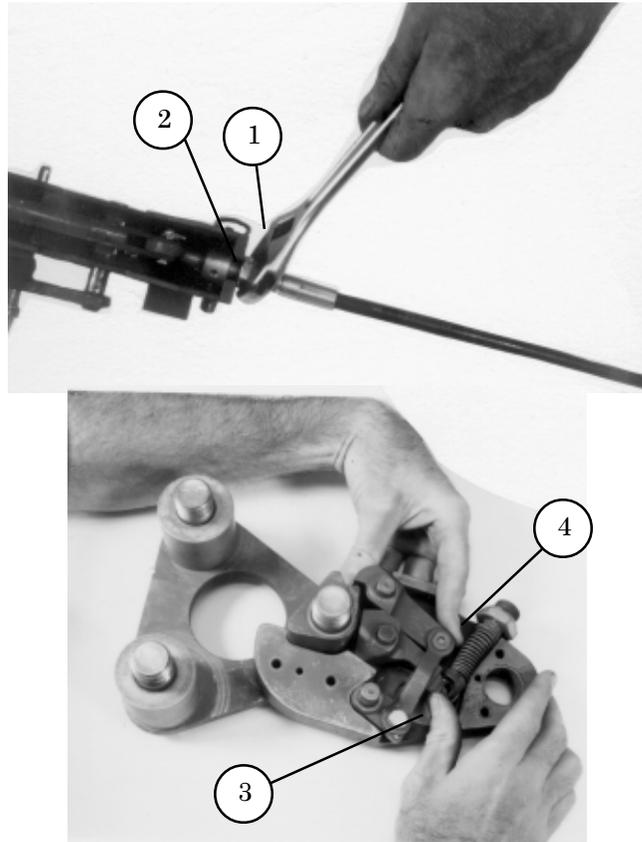


Figure 3-45. Cable Installed and Actuator Armed



**CAUTION**  
**The top plate of the latch assembly is removed for clarity only and is not authorized to be removed.**

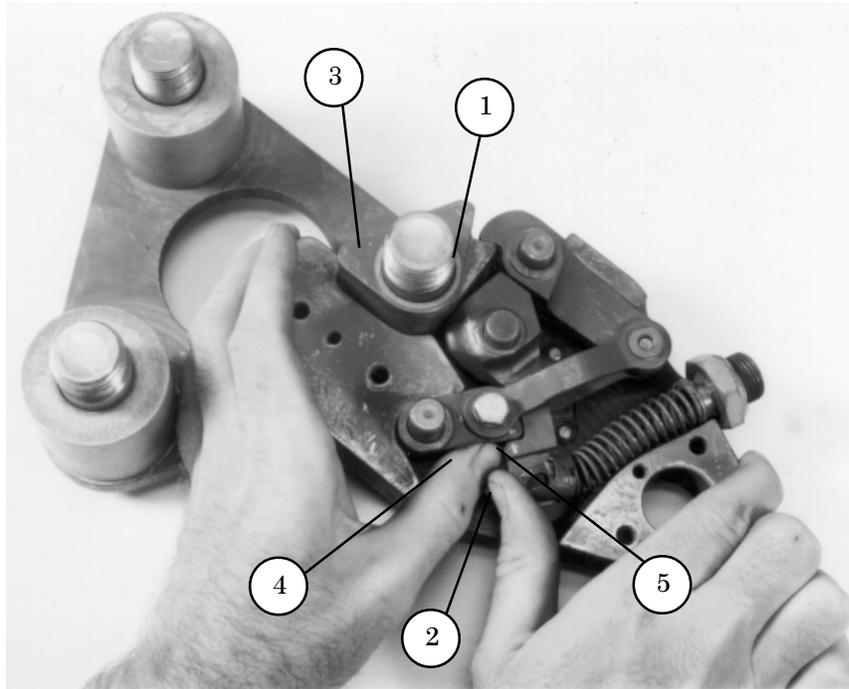
- 1 Use a wrench to tighten the locking nut on the cable until the nut is flush against the actuator body.
- 2 Make sure the adjusting collar is flush against the inside of the actuator body.

**CAUTION**  
**DO NOT overtighten the locking nut. This may cause the housing to crack.**

To ensure that the cam of the link assembly is properly seated in the latch assembly with the retainer hook holding the cam, release and then reseat the cam as follows:

- 3 Push up on the catch.
- 4 Push down on the retainer hook and idler link to free the cam, and remove the link assembly.

**Figure 3-46. Cable Installed and the Link Assembly Cam Seated**



**CAUTION**  
**The top plate of the latch assembly is removed for clarity only and is not authorized to be removed.**

Reseat the cam of the link assembly in the latch assembly as follows:

- 1 Set the edge of the cam in place within the latch.
- 2 Repeat steps 3 and 4, Figure 3-46.
- 3 Push cam into place.
- 4 Push the lock link up to engage the retainer hook.
- 5 Align the dot on the lock link with the arrow on the catch.

The cam of the link assembly is now properly seated under the retainer hook of the latch assembly.

**Figure 3-47. Link Assembly Cam Reseated**

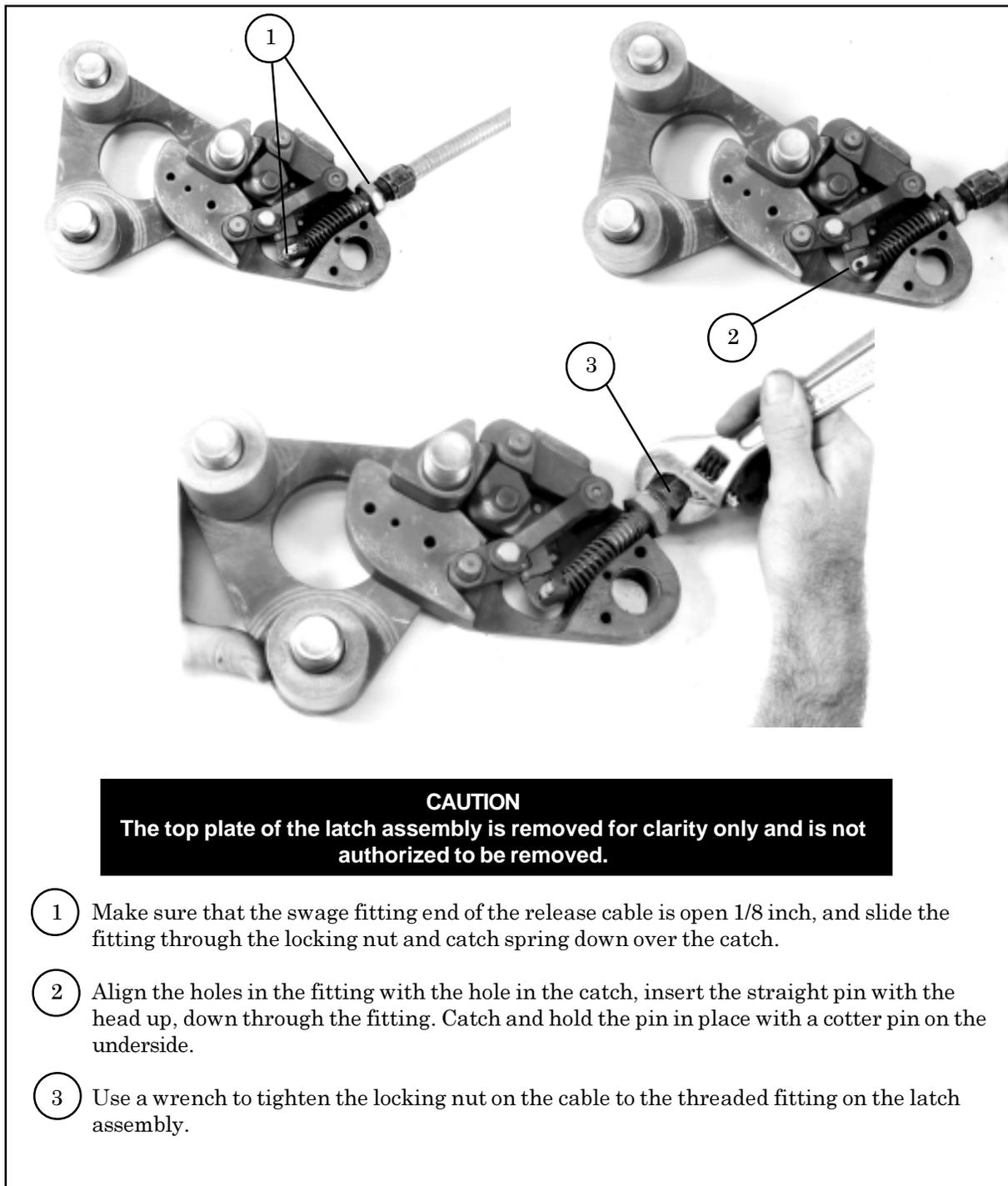
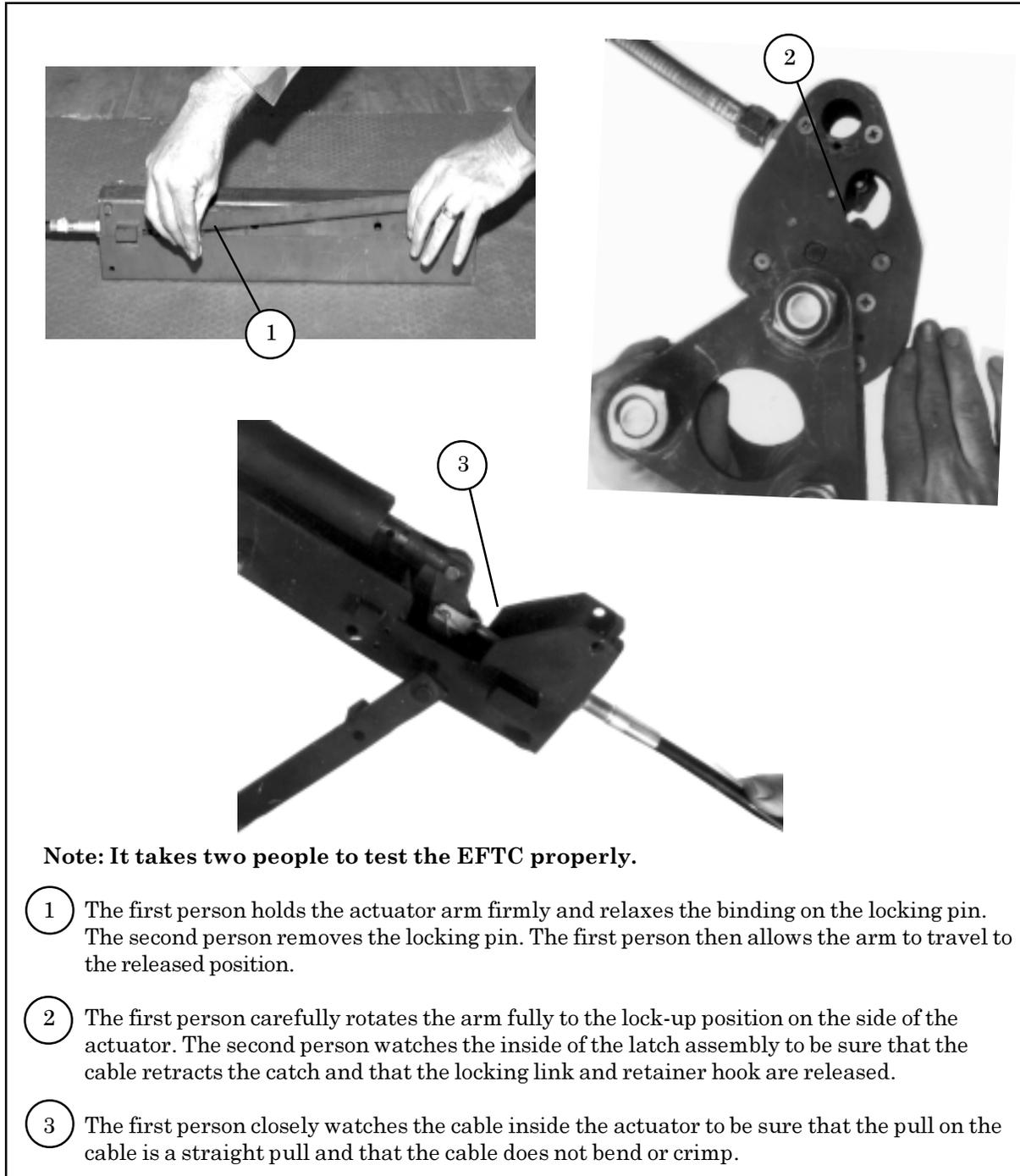


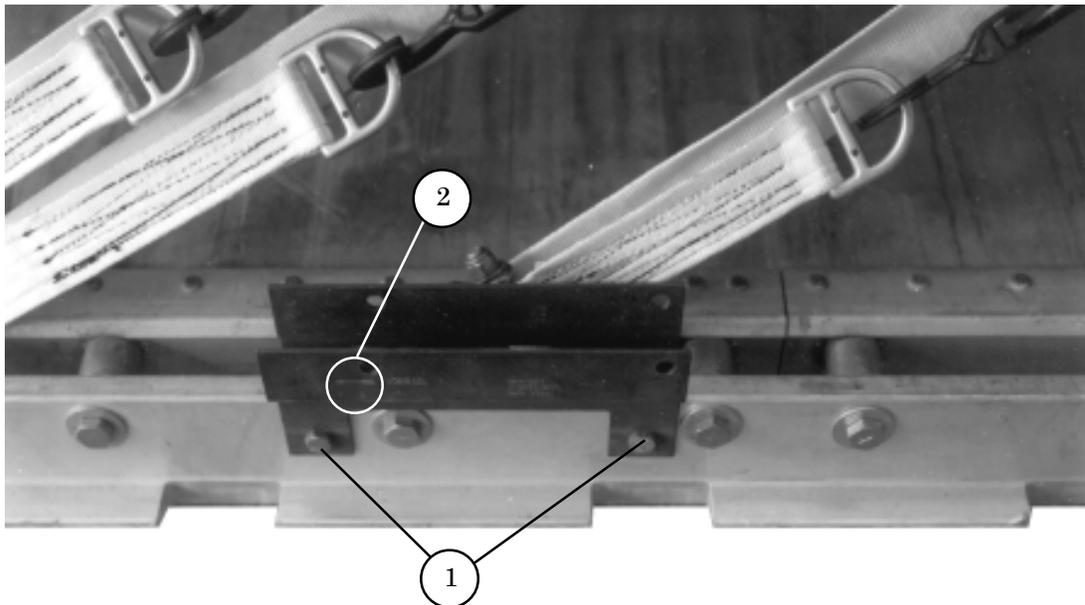
Figure 3-48. Latch Assembly Cable Adjusted

**b. Testing EFTC Extraction System.** Before each use of the EFTC extraction system, test it as shown in Figure 3-49.



**Figure 3-49. EFTC Tested**

*c. Preparing and Attaching the EFTC to the Type V Platform.* After the EFTC has been tested, disassemble it. Prepare the EFTC components and attach them to the type V platform as shown in Figures 3-50 through 3-52.



**CAUTION**

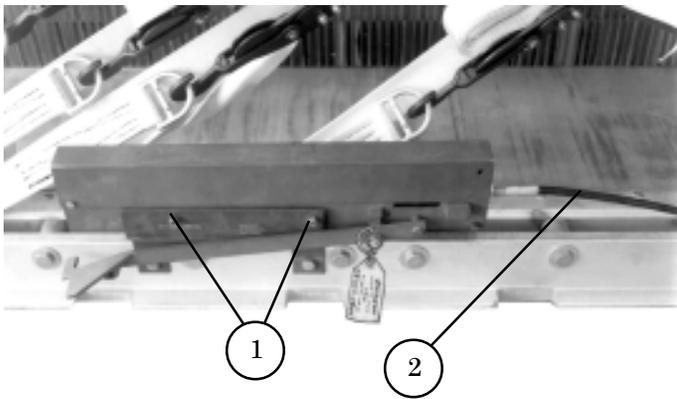
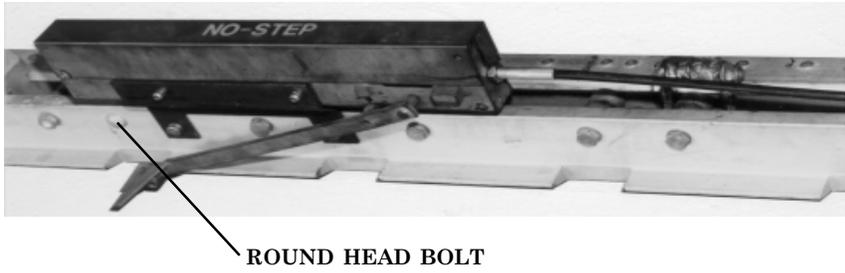
When attaching the EFTC mounting brackets on a 28 or 32-foot type V airdrop platform that has three sets of actuator mounting bracket holes, use only the rear most set of holes.

**Note:** Bolt the actuator mounting brackets to the bracket holes as directed in the specific rigging manual.

- ① Bolt the inside and outside actuator brackets to the left rail of the type V platform using self locking nuts.
- ② Make sure the arrow stamped on the outside mounting bracket points toward the front of the platform to show the brackets are properly installed.

**Figure 3-50. Actuator Mounting Brackets Installed to the Type V Platform Side Rail**

**CAUTION**  
 When the actuator arm falls directly over the side rail bolt, use a round head replacement bolt. (NSN 5306-00-151-0653)



**Step:**

1. Pin the actuator to the actuator brackets with the PIP pins provided. Make sure the PIP pins are put in from the inboard side of the bracket.
2. Pass the cable to the inside of the side rail tiedown straps to prevent movement of the cable. Tie the cable in place as directed by the specific rigging manual.

**Note: If a longer cable than specified in the specific rigging manual is used, make sure that it is routed in smooth s-shaped bends and with no 360 degree circles.**

**Figure 3-51. Actuator Pinned to Brackets and Position Verified**



**Step:**

3. Verify the positioning of the installed actuator as follows:
  - a. Hold the actuator arm in place, and remove the locking pin.

**CAUTION**  
**The actuator arm is under 175 pounds of force.**

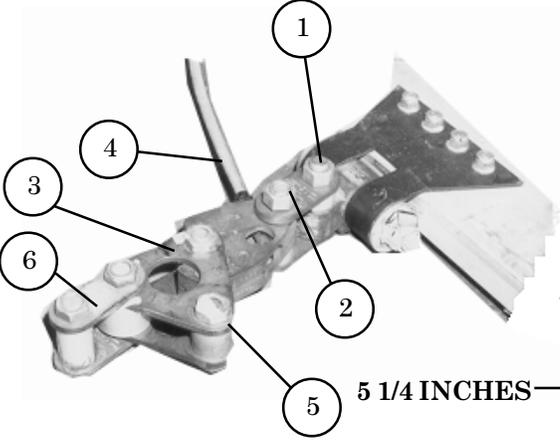
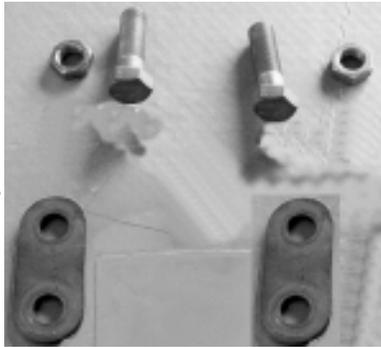
- b. Allow the arm to rotate down through the forward indent in the side rail.
- c. Make sure the arm clears the indent by 1/4-inch.
- d. If the arm **CLEAR**s the indent by 1/4-inch, return the arm to the armed position and replace the PIP pin.
- e. If the arm **FAILS** to clear the indent by 1/4-inch, make sure the correct mounting holes were used. If the correct holes were used, **REPLACE** the actuator.

**Note: After you verify the position of the actuator, remove the quick-release pins. Lay the actuator on the platform, and secure the actuator. This will keep the actuator from being damaged while the platform is being loaded in the aircraft.**

- f. If the type V platform is to be airdropped from a C-5 aircraft, install an actuator arm extension pin on the actuator arm as shown above.

**Figure 3-51. Actuator Pinned to Brackets and Positioned Verified (Continued)**

**CAUTION**  
Tie the slack in the cable in a smooth S-shape bend. This should be tied to the side of the load or to a lashing on the type V platform. This will avoid binding problems in the cable.

- 1 Bolt one end of a 5 1/4-inch, latch connector assembly (measured from end to end) to the platform extraction bracket.
- 2 Bolt the latch assembly to the latch connector assembly.

**CAUTION**  
The modified extraction lugs are identified by the presence of a 1/2-inch steel strip welded or machined on the lower front flat surface of the extraction lug.

**Note: This raises the latch assembly to prevent damage to the aircraft.**

- 3 Follow steps 3 and 4, Figure 3-46, and steps 1 through 5, Figure 3-47, to attach the coupling link assembly to the latch assembly.
- 4 Follow steps 1, 2, and 3, Figure 3-48, to attach the cable assembly to the latch assembly.
- 5 Bolt one end of the deployment line to the right spacer of the coupling link assembly.
- 6 When a 6-loop extraction line is used, the adapter link assembly **MUST** be used to separate the loops of the line.

**Figure 3-52. Latch Assembly Bolted to Type V Platform Extraction Bracket**

Section VI

## Release Assemblies

### M-1 CARGO PARACHUTE RELEASE

3-23. Test, attach, and safety the M-1 cargo parachute release as follows:

**CAUTION**  
**DO NOT use the M-1 cargo parachute release with four G-11B cargo parachutes. The M-2 cargo parachute release MUST be used.**

*a. Testing Timer.* Before each use, seat, arm, and test the delay timer as shown in Figures 3-53 through 3-55.

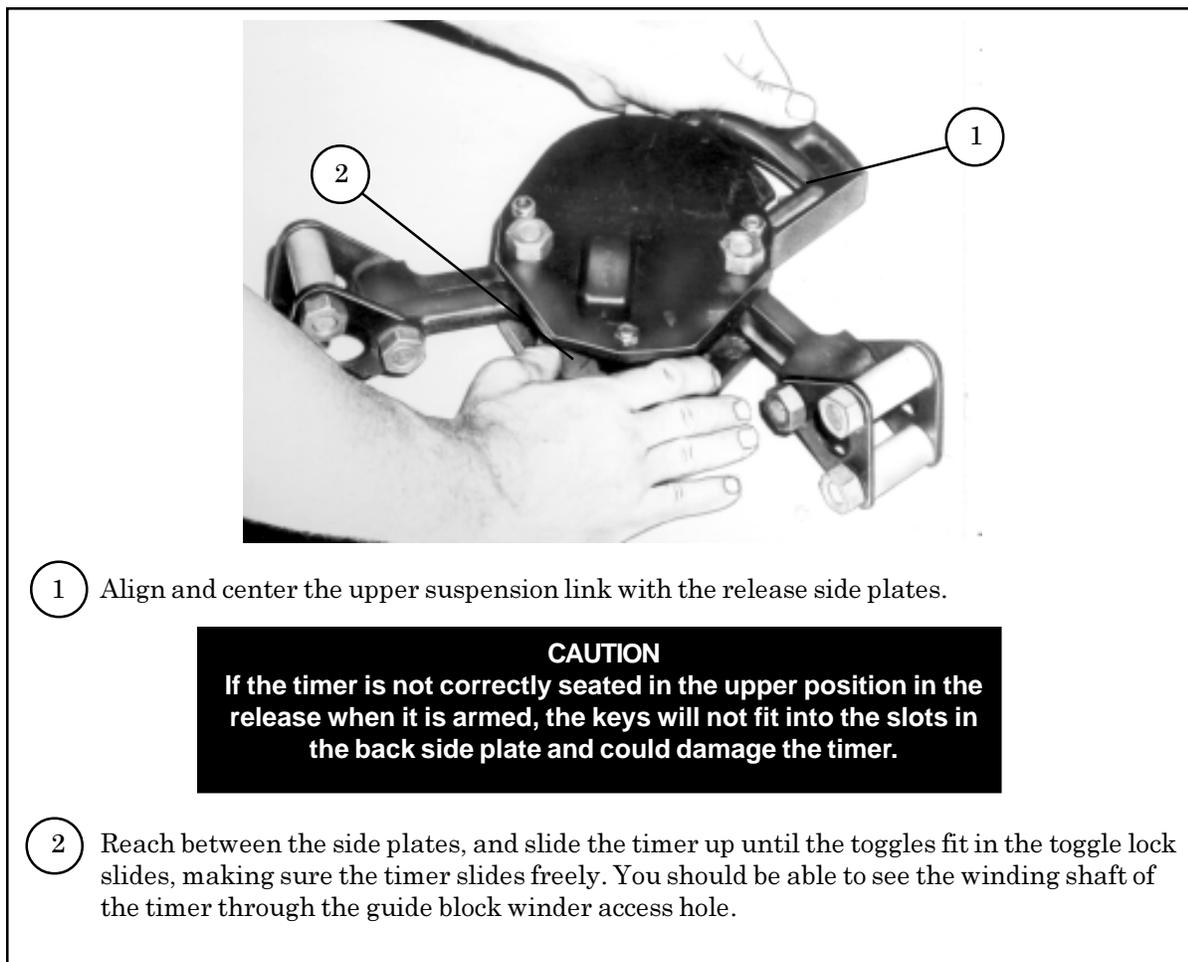


Figure 3-53. Delay Release Timer Seated

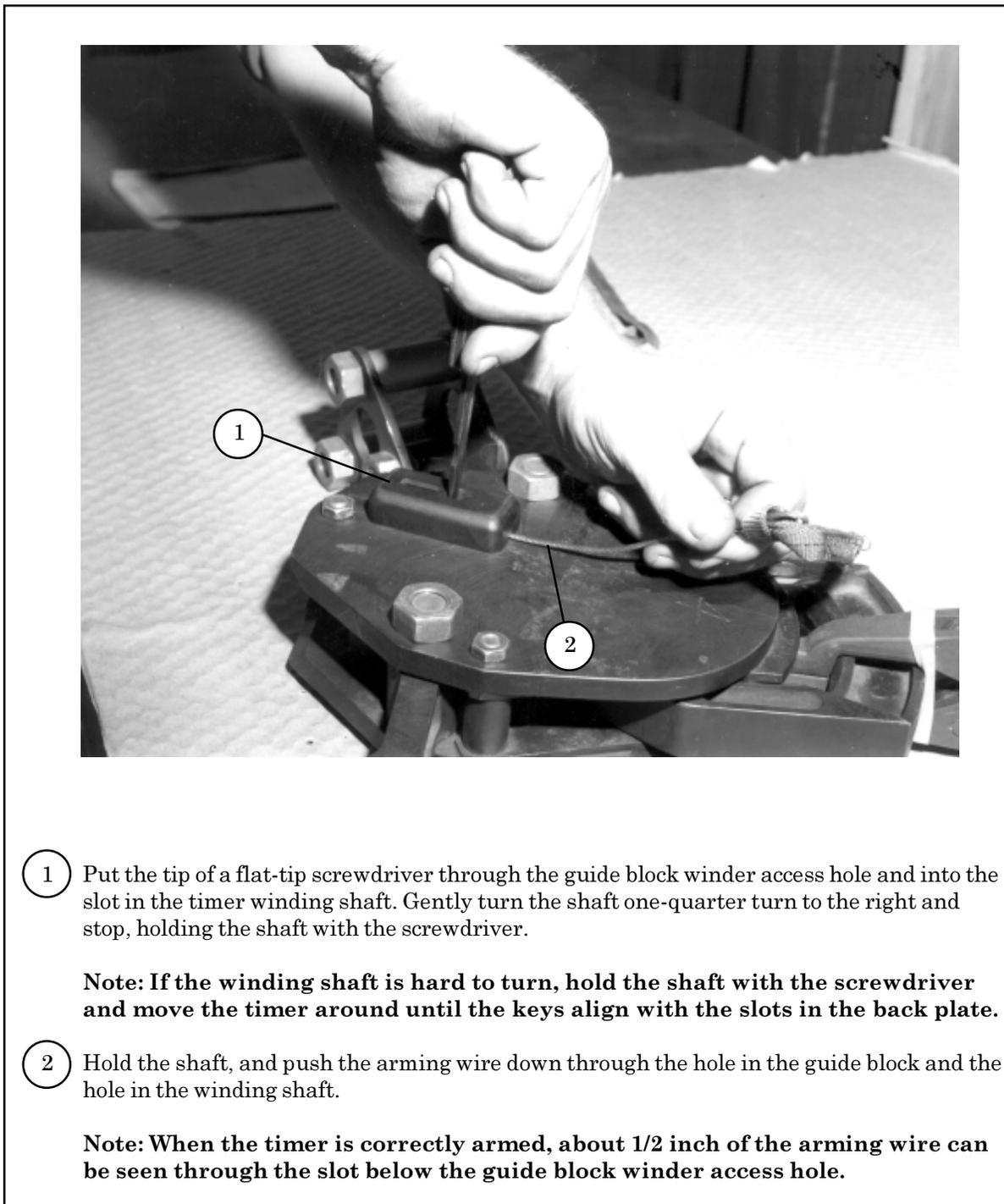
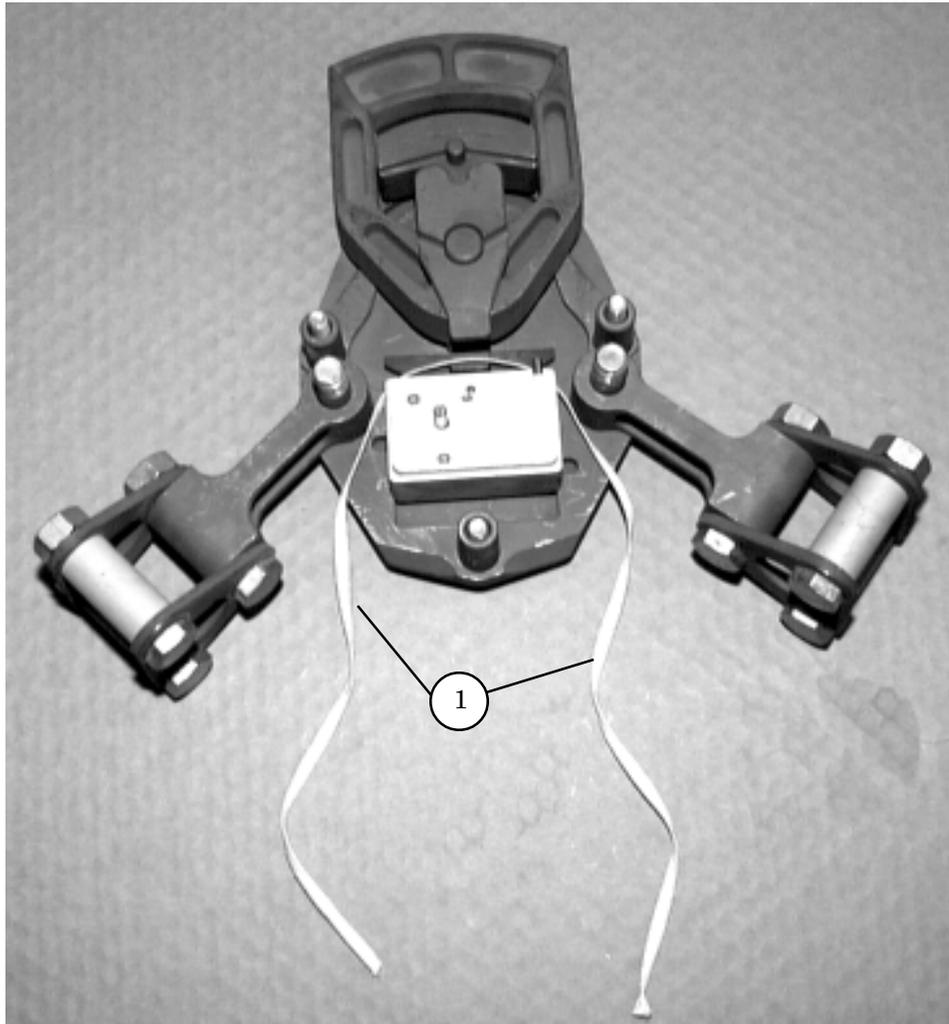


Figure 3-54. Timer Armed

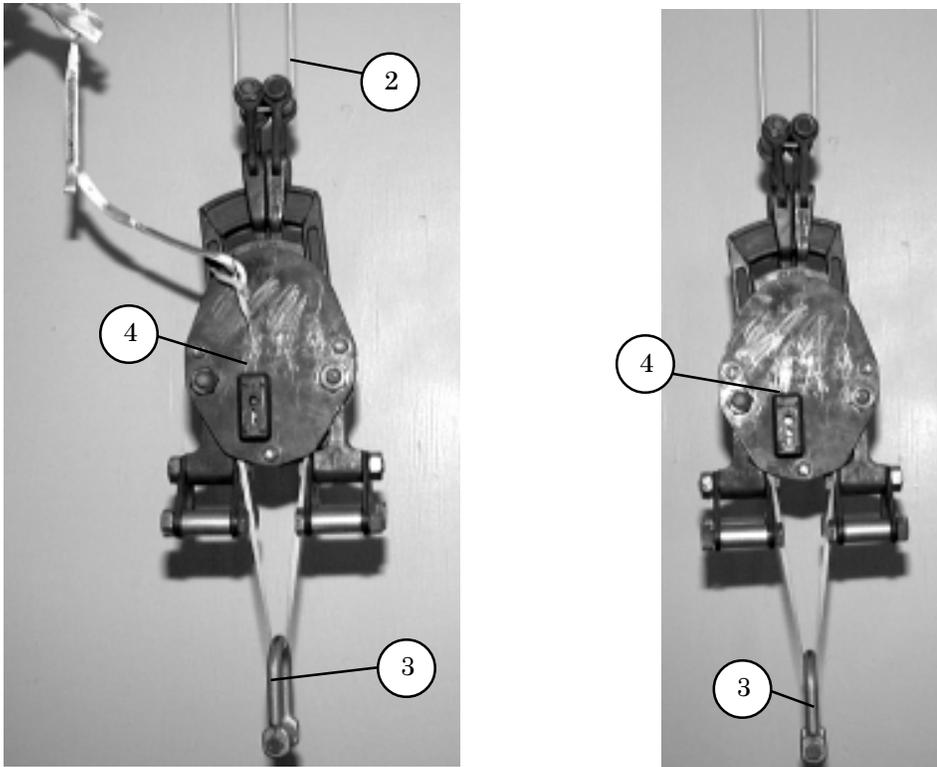
**Note: A delay release timer will be tested before each use.**



- 1 Pass a length of type I, 1/4-inch cotton webbing up between the release side plates, over and around the center of the timer, and back down between the side plates. The side plate and a toggle lock slide have been removed to show how the webbing passes around the timer. You may use a length of wire to help you pass the webbing around the timer.

**Figure 3-55. Testing Timer**

**CAUTION**  
 Do not over tighten the face side plate. Make sure the bolts are tightened in an alternating sequence.

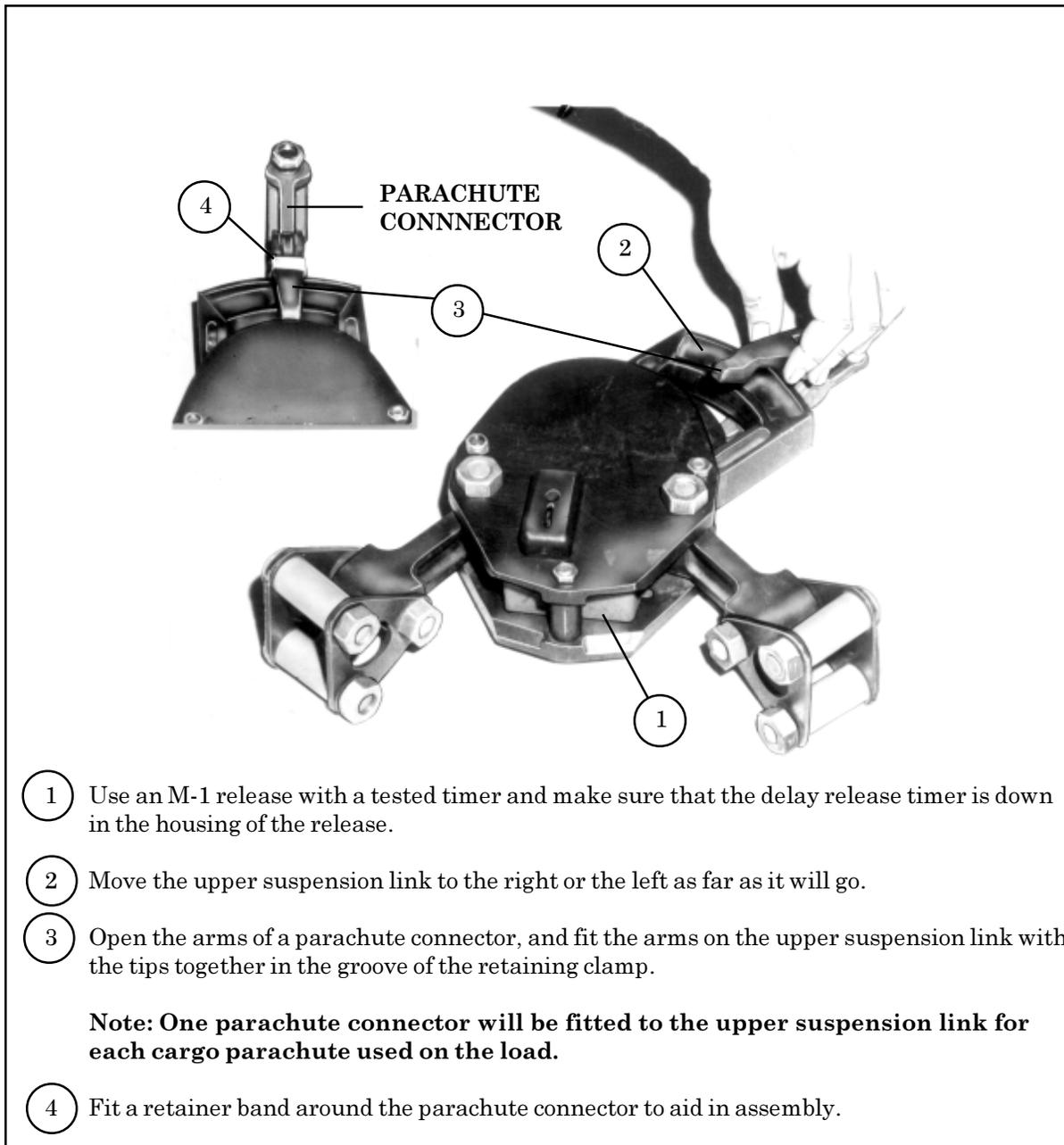


- 2 Hang the release in a straight, level position.
- 3 Tie a 10-ounce weight, such as a platform clevis with bolt or a parachute release connector, without the nut and bolt, to the type I, 1/4-inch cotton webbing.
- 4 Pull the arming wire from the timer. Count the seconds from the time the wire is pulled until the timer falls within the release.

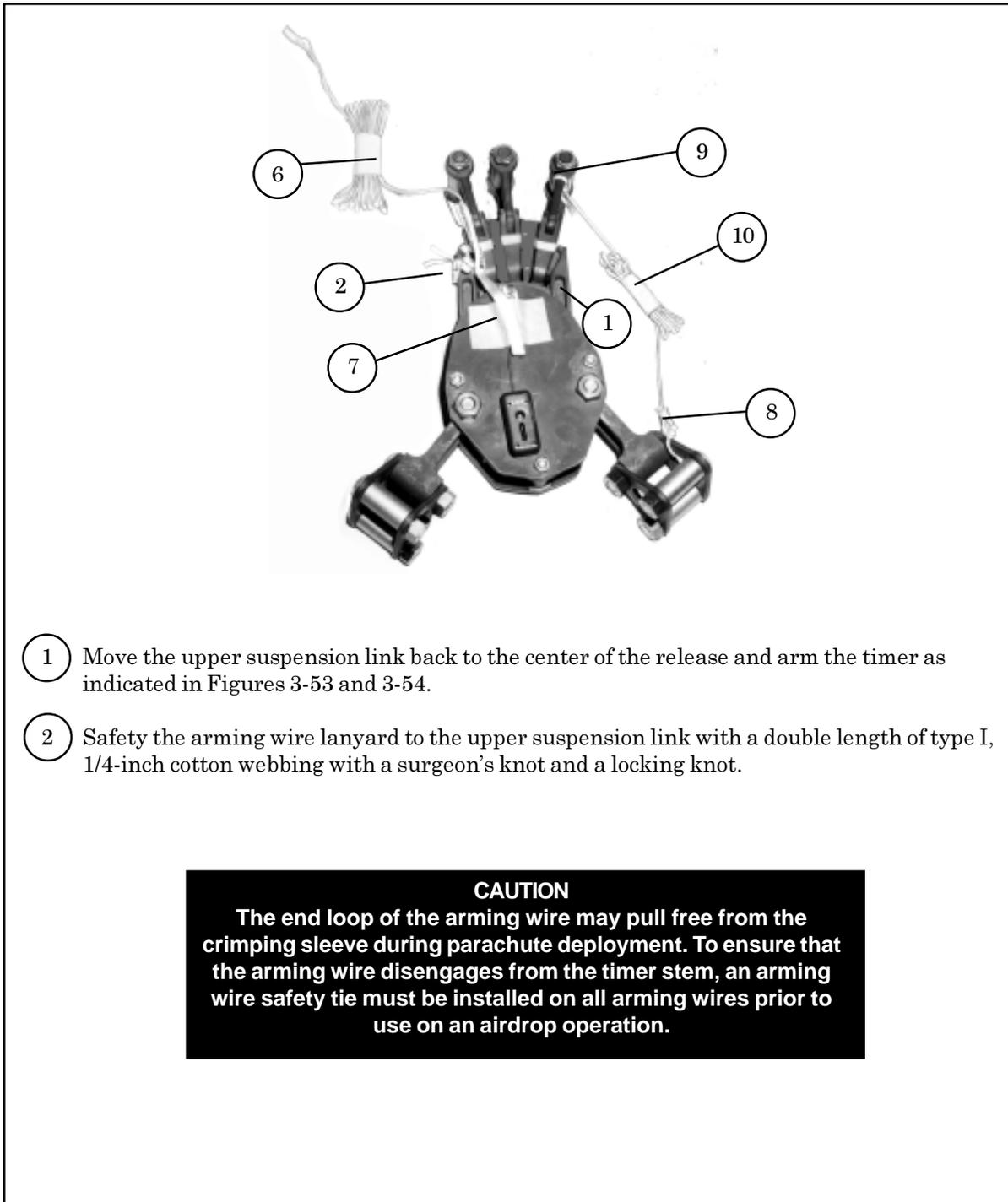
**Note:** If the timer fails to fall after the allotted time (12 to 16 seconds), remove the side plate and check the four screws holding the arming wire guide block to the side plate for burrs. If the screw heads are burred, remove the burrs by filing or replace the screws. Retest the timer. If there is a second failure, remove and replace the timer.

Figure 3-55. Testing Timer (Continued)

*b. Preparing, Attaching, and Safety Tying Release.* Prepare, attach, and safety the M-1 cargo parachute release as shown in Figures 3-56 through 3-58.



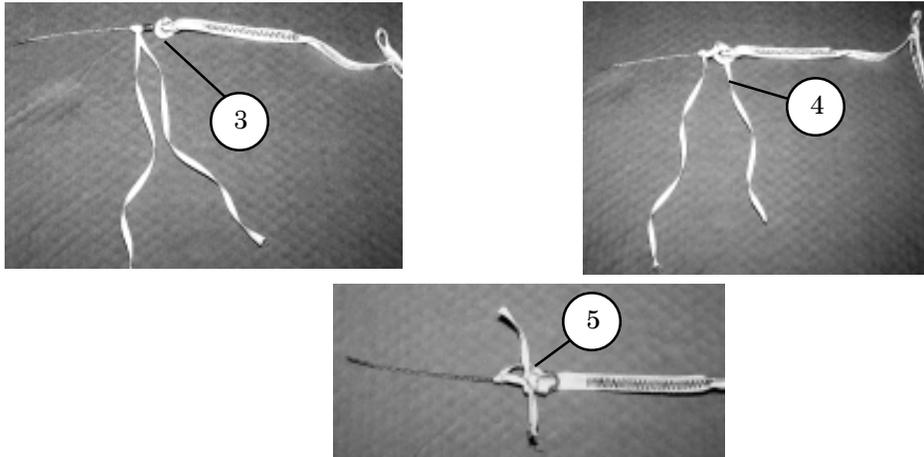
**Figure 3-56. Parachute Connector Fitted to Upper Suspension Link of M-1 Release**



- 1 Move the upper suspension link back to the center of the release and arm the timer as indicated in Figures 3-53 and 3-54.
- 2 Safety the arming wire lanyard to the upper suspension link with a double length of type I, 1/4-inch cotton webbing with a surgeon's knot and a locking knot.

**CAUTION**  
 The end loop of the arming wire may pull free from the crimping sleeve during parachute deployment. To ensure that the arming wire disengages from the timer stem, an arming wire safety tie must be installed on all arming wires prior to use on an airdrop operation.

Figure 3-57. M-1 Release Prepared



**Note:** With the arming wire lanyard attached to the arming wire loop, the arming wire loop shall be designated as the top. Install the safety tie as follows:

**This safety tie should be inspected at the joint airdrop load inspection, before and after loading.**

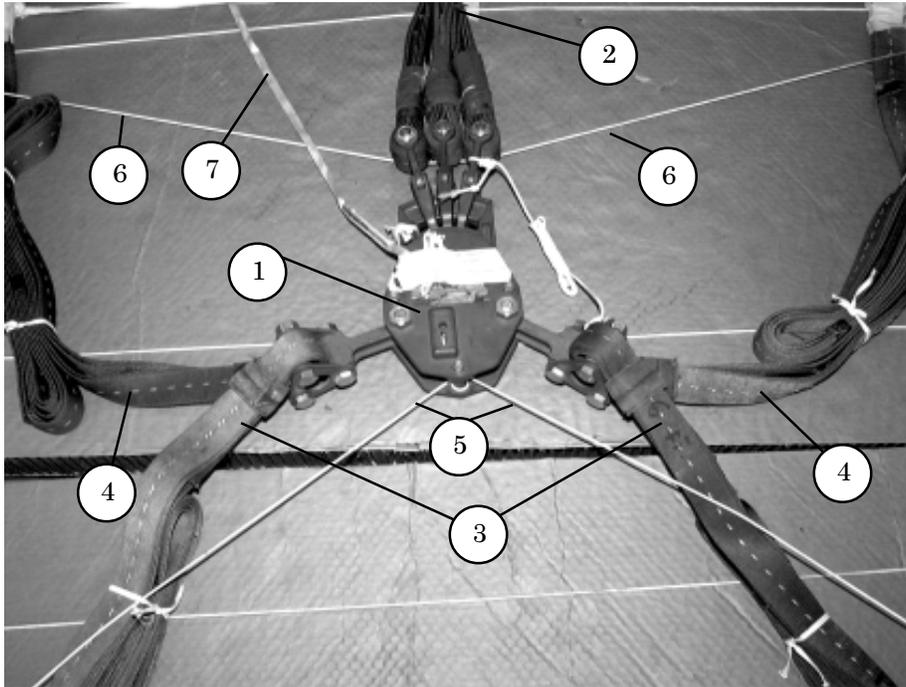
- 3 Girth hitch a 12-inch length of 1/4-inch cotton webbing on the safety wire just below the metal fastener.
- 4 Route one running end of the 1/4-inch cotton webbing through the looped ends of the arming wire and lanyard.
- 5 After ensuring there is 1/2-inch to 1-inch of slack in both running ends, tie a surgeon's knot and locking knot in the 1/4-inch cotton webbing.
- 6 Fold the slack in the lanyard, and tape the folds in place with one turn of masking tape.
- 7 Fold the slack in the lanyard, between the safety tie and the arming wire, and tape the fold to the face side plate with one piece of masking tape.

**Note:** Include the following data on the masking tape: name, date, and timer seconds.

- 8 Tie one end of a 5-foot length of type III nylon cord (dragline) to one side of the lower suspension link.
- 9 Tie the other end of the dragline to a parachute connector.
- 10 Fold the slack in the dragline and tape the folds in place with one turn of masking tape.

**Figure 3-57. M-1 Release Prepared (Continued)**

**CAUTION**  
 Place the release on the load with the parachute connectors toward the rear of the platform and with the guide block up. Bolt the suspension slings to the lower suspension links so that they will not change position when the load is suspended. Make sure the arming wire lanyard is routed over all items.



- ① Put the release on the load as instructed in the specific rigging manual for the load.

**Note: Bolt a 3-foot (2-loop), type XXVI nylon sling to the parachute clevis of one G-11B cargo parachute and to the parachute connector fitted to the release.**

- ② Bolt the riser extensions of two G-12E, or two or three G-11B cargo parachutes to the parachute connectors already fitted to the release.
- ③ Attach the front suspension slings to the top bolts of the lower suspension link.
- ④ Attach the rear suspension slings to the lower bolts of the lower suspension link. The rear slings will have a half twist towards the parachutes.
- ⑤ Run a length of type III nylon cord to encircle the lower spacer, and tie the ends of the cord to points on the front of the load or platform.
- ⑥ Run a length of type III nylon cord through the parachute connectors, and tie the ends of the cord to points on the rear of the load or platform.
- ⑦ Tie the lanyard to a carrying handle of a parachute with three alternating half hitches and an overhand knot in the running end.
- ⑧ Fold the slack in the lanyard, and tape the folds in place with one turn of masking tape. (Not shown)

**Figure 3-58. M-1 Release Attached and Safetied to Load**

## M-2 CARGO PARACHUTE RELEASE

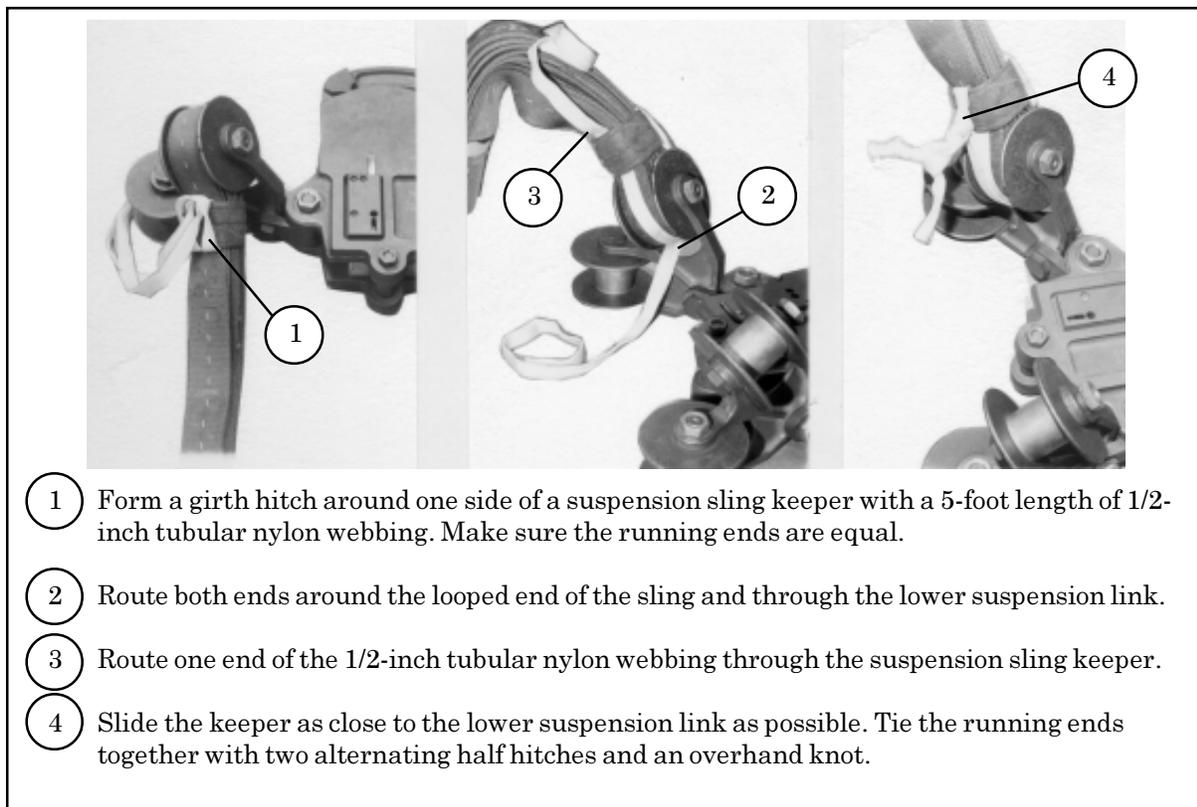
3-24. Prepare, attach, and safety the M-2 cargo parachute release as follows:

**a. Preparing Release.** Test the timer and prepare an M-2 cargo parachute release the same as the M-1 release.

**Note: Three to eight connectors may be fitted to an M-2 release. The M-2 release requires a 5-foot dragline made from 1/2-inch tubular nylon webbing.**

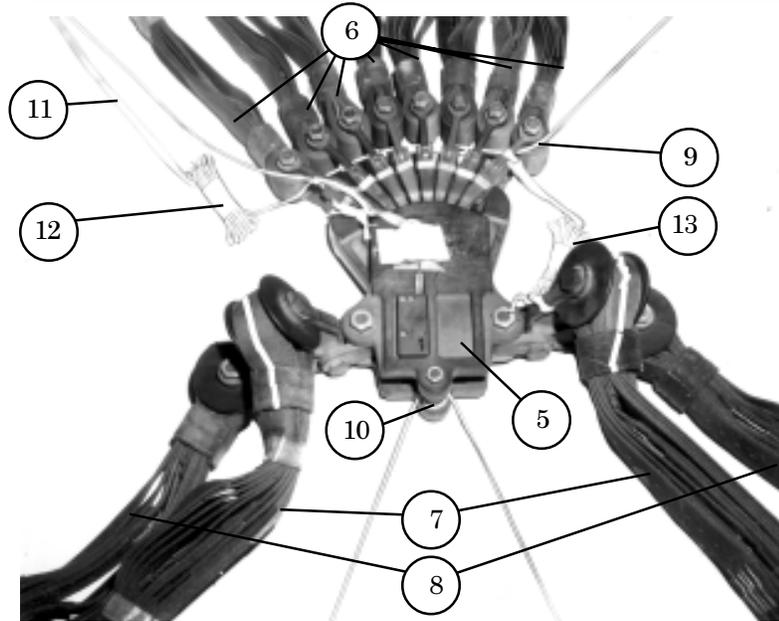
**b. Attaching and Safety Tying Release.** Attach and safety the M-2 cargo parachute release to the load as shown in Figure 3-59.

**Note: When using the M-2 cargo parachute release on the 28-foot and 32-foot platforms, use a 25-foot arming wire lanyard. Make the lanyard according to TM 10-1670-296-20&P/TO 13C7-49-2.**



**Figure 3-59. M-2 Release Prepared, Attached, and Safett Tied to Load**

**CAUTION**  
 Place the release on the load with the parachute connectors toward the rear of the platform and with the guide block up. Bolt the suspension slings to the lower suspension links so that they will not change position when the load is suspended.



- 5 Put the release on the load as instructed in the specific rigging manual for the load.
- 6 Bolt the riser extensions of three to four G-11B or five to eight G-11C cargo parachutes to the parachute connectors already fitted to the release.
- 7 Attach the front suspension slings to the top bolt of the lower suspension link.
- 8 Attach the rear suspension slings to the lower bolt of the lower suspension link. The rear slings will have a half twist towards the parachutes.
- 9 Run a length of type III nylon cord through the connectors, and tie the ends of the cord to points on the rear of the load or platform.
- 10 Run a length of type III nylon cord around the lower spacer, and tie the ends of the cord to points on the front of the load or platform.
- 11 Tie the lanyard to the carrying handle of a parachute with three alternating half hitches and an overhand knot in the running end.
- 12 Fold the slack in the lanyard, and tape the folds in place with one turn of masking tape.
- 13 Install the drag line and fold the slack. Secure with masking tape.

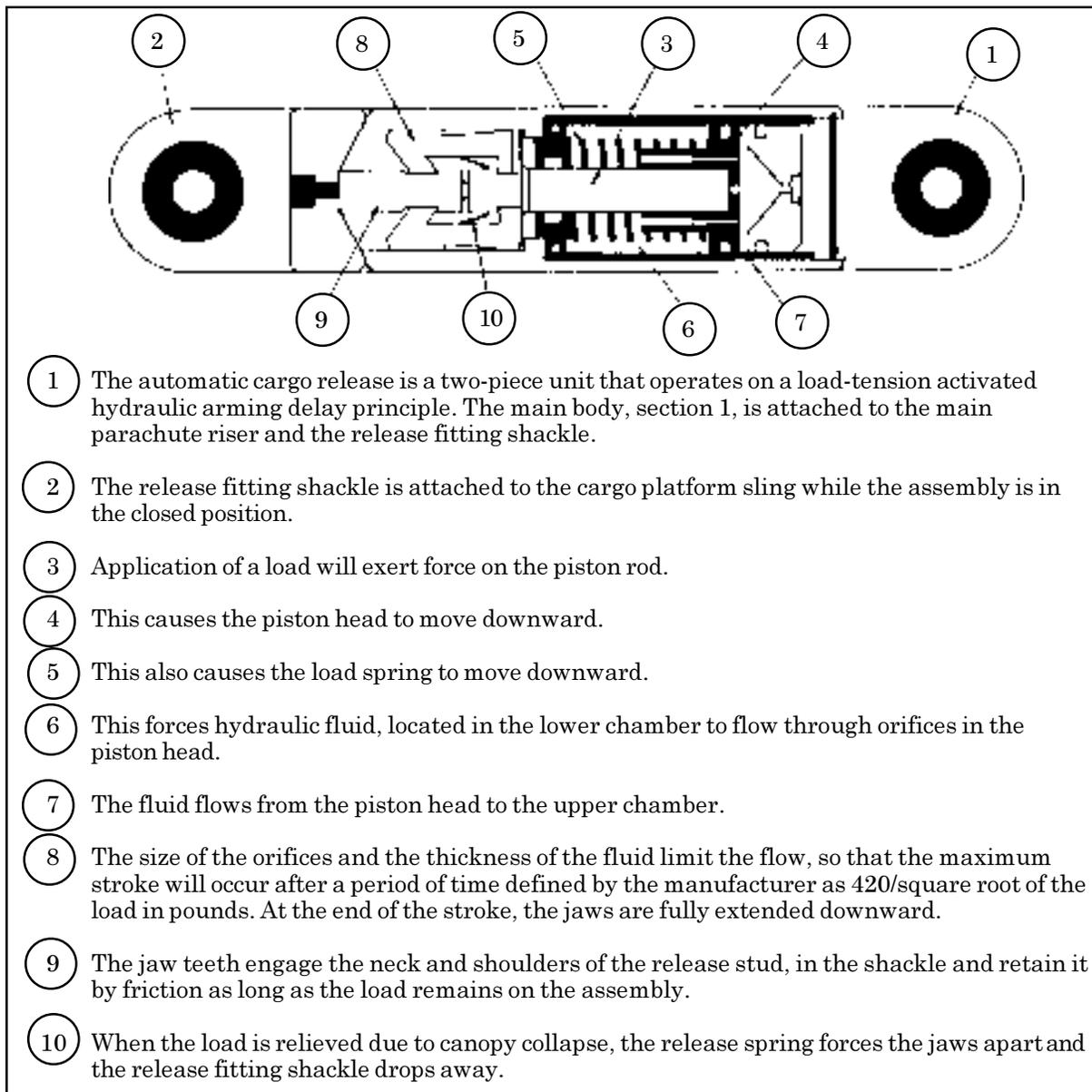
**Figure 3-59. M-2 Release Prepared, Attached, and Safety Tied to Load (Continued)**

## THE AUTOMATIC CARGO RELEASE (NOT FOR ARMY USE)

3-25. The automatic cargo release is a two-piece unit that operates on a load-tension activated hydraulic arming delay principal. It has no internal maintenance or repair.

**Note: The service life of the release is 10 years from the date of manufacture.**

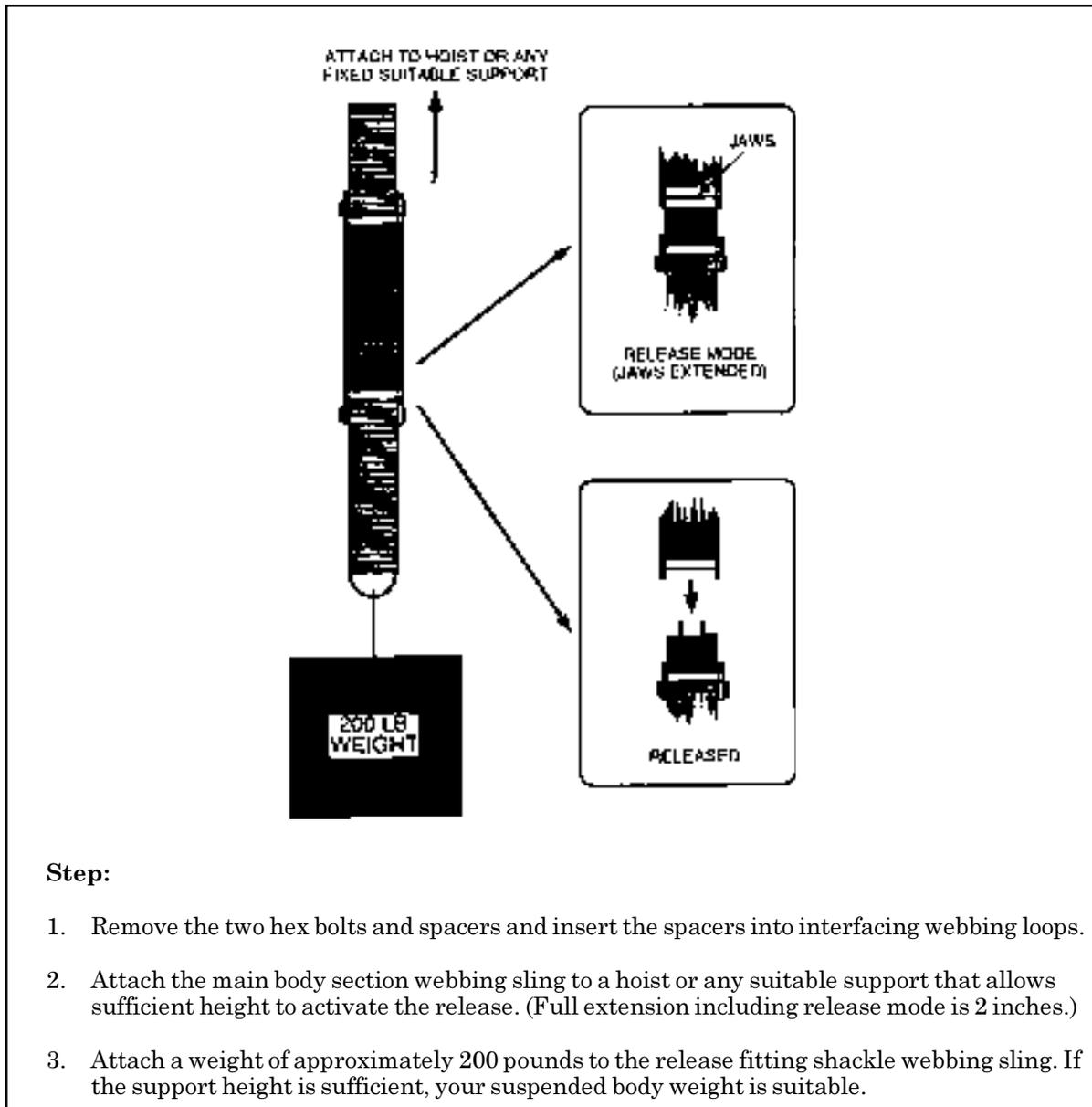
*a. Physical and Functional Characteristics.* The physical and functional characteristics of the automatic cargo release are shown in Figure 3-60.



**Figure 3-60. Physical and Functional Characteristics**

**b. Original Receipt Inspection.** After removing the unit from its packaging, visually verify that all components of Figure 3-60 are present and in acceptable condition for use (no corrosion, deformation, leakage, or other abnormalities). Perform a pre-drop activation test as shown in Figure 3-61.

**Note:** When testing the Automatic Cargo Release the main body must be facing up.



**Figure 3-61. Pre-Drop Activation Test**



**Step:**

4. Time the arming delay starting from when the load is applied to when the jaws of the release extend below the cutouts in the bottom section of the main body section. Release mode should occur after 30 to 40 seconds under a 200-pound load. If the release mode and full extension is reached in less than 30 seconds under a suspended load of 200 pounds, the release is to be considered unserviceable.

**Figure 3-61. Pre-Drop Activation Test (Continued)**

**CAUTION**  
Ensure the release fitting shackle is held when the weight is released to prevent it falling upon separation which could cause personal injury.



**Step:**

5. When the release mode has been achieved, simulate impact by lowering the hoist (if used) until the load is relieved; or if body weight is used, (ensure the release fitting shackle is held securely to prevent personal injury upon separation), quickly release the load. The spring loaded jaws will kick outward releasing the release fitting shackle which allows the cargo release unit to immediately separate. The outer lip on the jaws will catch on the lip of the main body section, holding the piston extracted and retaining the jaws in the open position.

**Figure 3-61. Pre-Drop Activation Test (Continued)**

**Step:**

6. Inspect the main body section for fluid leakage. The jaws and release fitting shackle should be totally dry. The silicone fluid is clear and if any evidence of leakage is apparent, it will appear as wet and glistening. If leakage is evident, the release will not be used.

**Note: The automatic cargo release part number 811-00220 incorporates a removable filter. The automatic cargo release part number 811-00220-1/-2 incorporates a nonremovable solid aluminum cap.**

7. Inspect the presence, condition, and security of the removable filter. The filter is a thin silver disc of porous metal located on the end of the main body section. The removable filter is held securely in the main body piston cavity by a washer and retaining ring.
8. Inspect for presence, condition, and security of the solid aluminum cap. The cap is located on the end of the main body section.
9. Preparation for reuse is accomplished by simply flushing foreign particles from the unit and air drying.

**Figure 3-61. Pre-Drop Activation Test (Continued)**

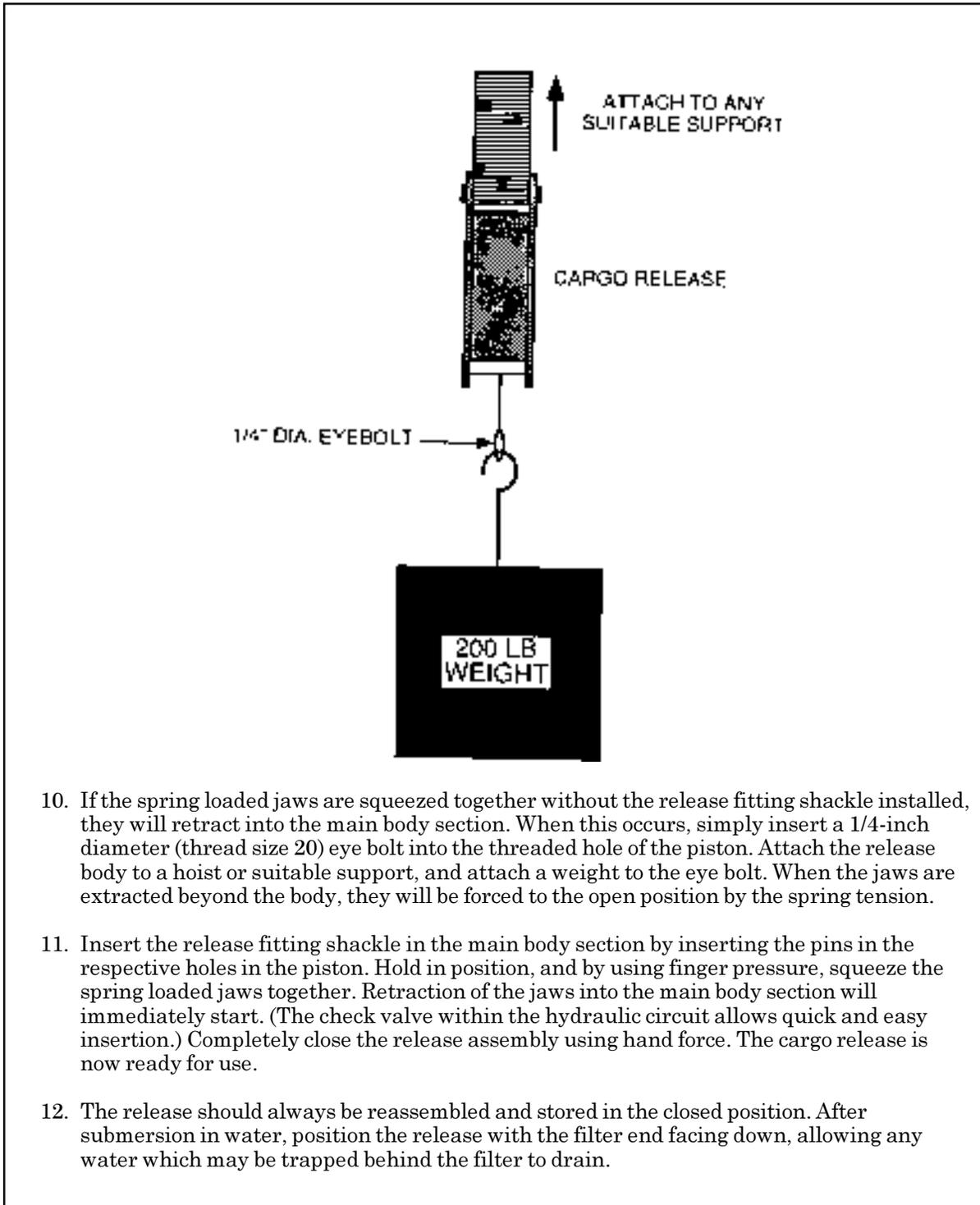
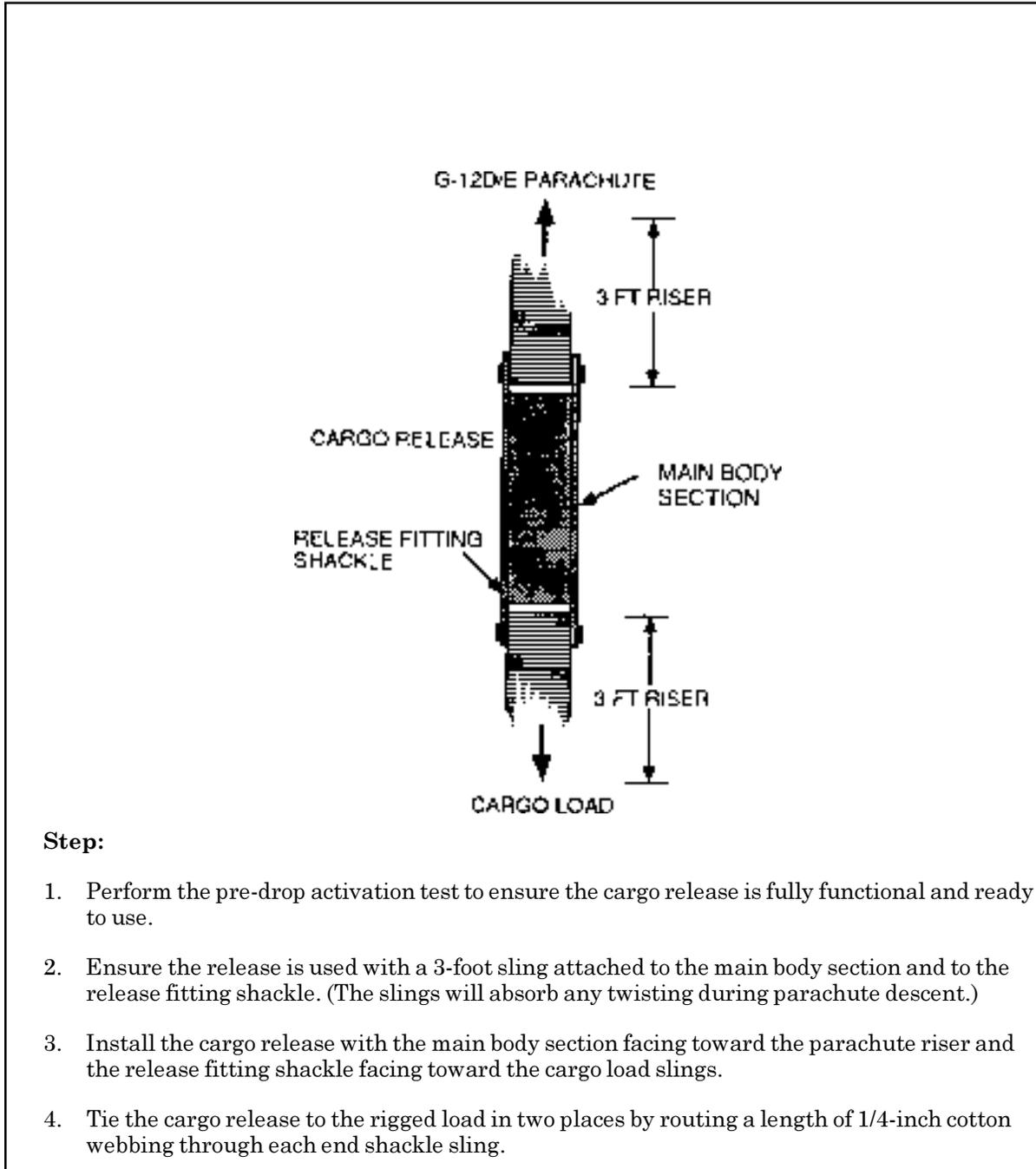


Figure 3-61. Pre-Drop Activation Test (Continued)

*c. Installation For Airdrop.* Instructions for installing the cargo release are shown in Figure 3-63.



**Figure 3-62. Cargo Release Installed**

*d. Post Drop Maintenance.* Perform post drop maintenance according to the following:

**Step:**

1. Remove the retaining ring in the upper cargo release assembly using Truarc ring pliers. To remove the filter and washer, hold the release filter end downward. The filter and washer should fall out. Thoroughly rinse the main body section and release fitting shackle with fresh water. Direct flow using a water hose or faucet would be ideal. If the cargo release has not been maintained, the filter may adhere to the housing bore. Where severe corrosion exists, the filter may have to be replaced.
2. Thoroughly rinse the main body section and release fitting shackle with fresh water. (For nonremovable solid aluminum cap)
3. Inspect the cargo release visually for obvious damage. Use low pressure air if available to dry the unit. Minor leakage of the silicone fluid will be very difficult to detect at this point.

**Note: The release fitting shackle assembly, (number 811-00324-1) may be procured through normal supply channels.**

4. Reassemble the unit by inserting the release fitting shackle into the main body section and squeezing the spring loaded jaws together. Completely close the release assembly using hand pressure. If the release does not close fully and the ball locks cannot snap in place, then the unit should be subjected to the pre-drop inspection test.
5. To completely dry, hang or stand the assembled unit with the filter end (main body section) facing down to allow drainage of any water that may have accumulated behind the filter.
6. Any discrepancies found or suspected will be cause for rejection. Return the unit with a brief description of the problem and a point of contact to: Commander, Code 461100D, Naval Air Warfare Center Weapons Division, 1 Administration Circle, China Lake, CA 93555-6001. Do not return the unit to the manufacturer.

## PARACHUTE RISERS ATTACHED TO THE PARACHUTE RELEASE

3-26. Lay the parachute release on top of the load with the bolt end of the parachute connectors toward the cargo parachutes. Bolt the parachute riser extensions to the parachute connectors of the M-1 or M-2 parachute releases as shown in Figures 3-63 through 3-65.

**Note: Bolt the parachute riser extensions to the parachute connectors from rigger's right to left. They must be in the numerical order given for four-, six-, and eight-parachute loads. For seven-parachute loads, delete the eighth riser extension.**

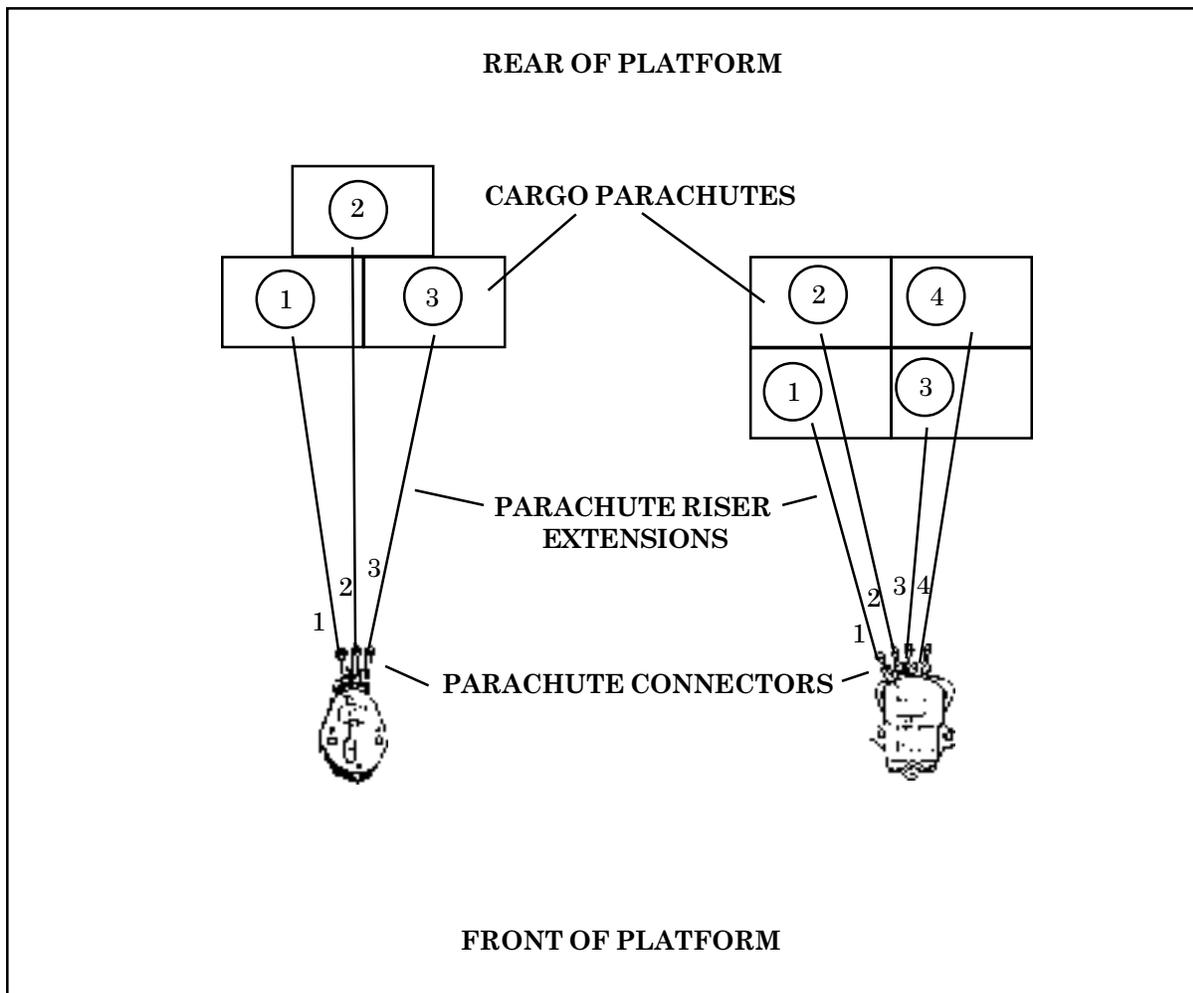


Figure 3-63. Three and Four Parachute Riser Extensions Attached to the Parachute

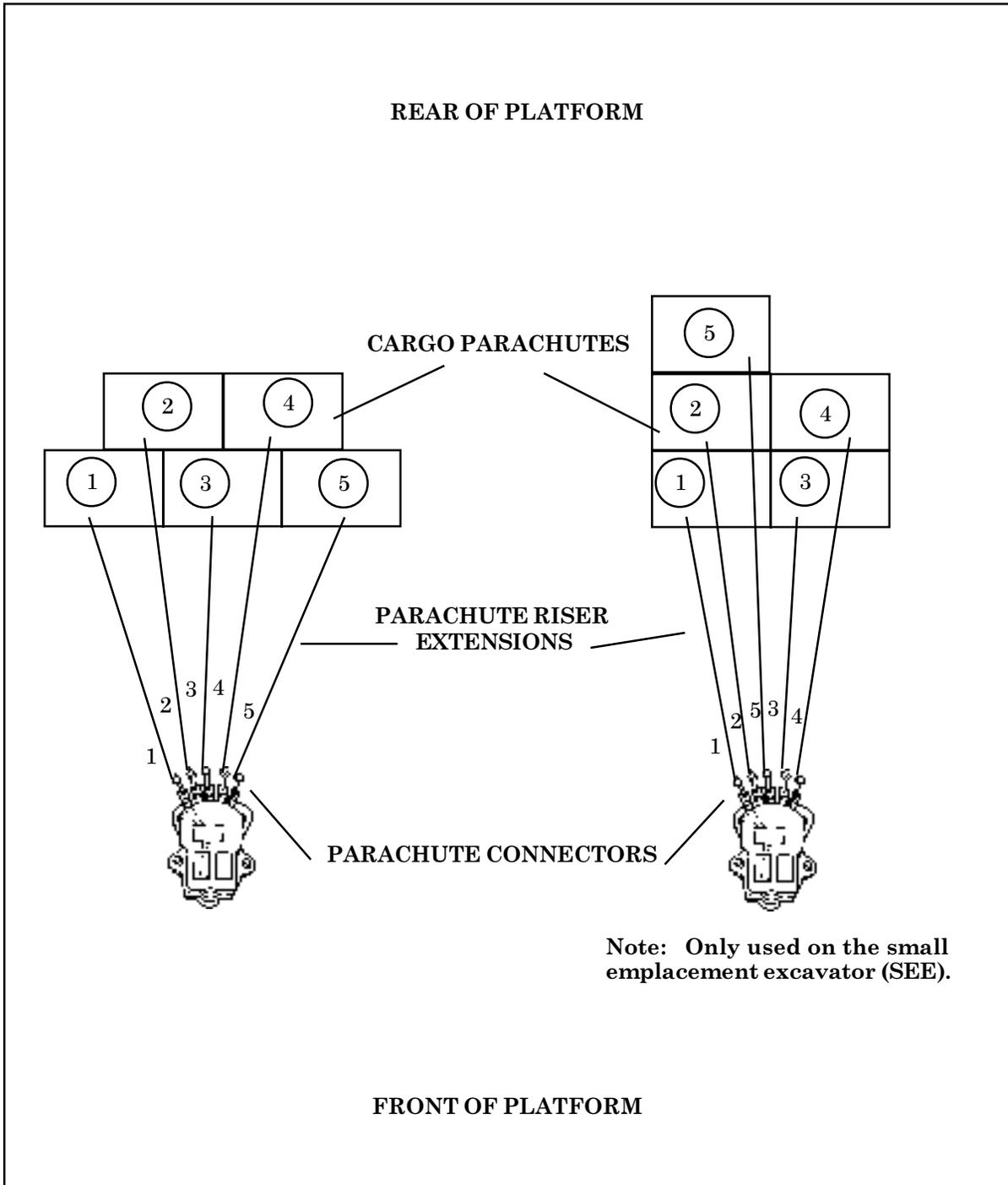


Figure 3-64. Five Parachute Riser Extensions Attached to the Parachute

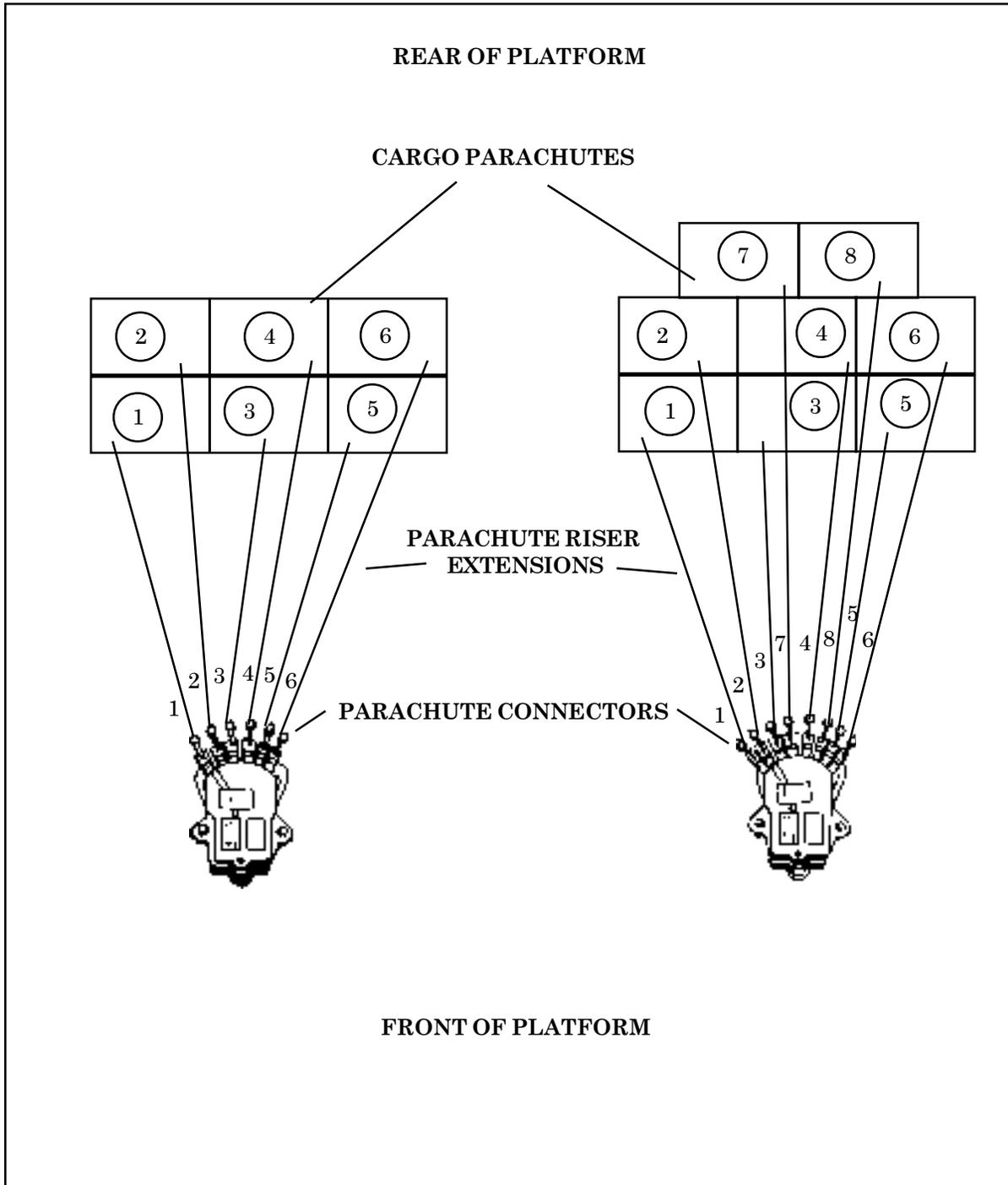


Figure 3-65. Six and Eight Parachute Riser Extensions Attached to the Parachute

Section VII

## Extraction Lines And Parachutes

### EXTRACTION LINES

3-27. The size and length of the extraction line used depends on the aircraft used and the size of the cargo extraction parachute rigged on the load.

#### CAUTION

While attaching the extraction line to the cargo extraction parachute, ensure that the keepers on the extraction line and the adapter web are pushed tight against the link and are taped in place with cloth-backed tape. If a keeper is not present on the adapter web or extraction line, tape in place with cloth-backed tape.

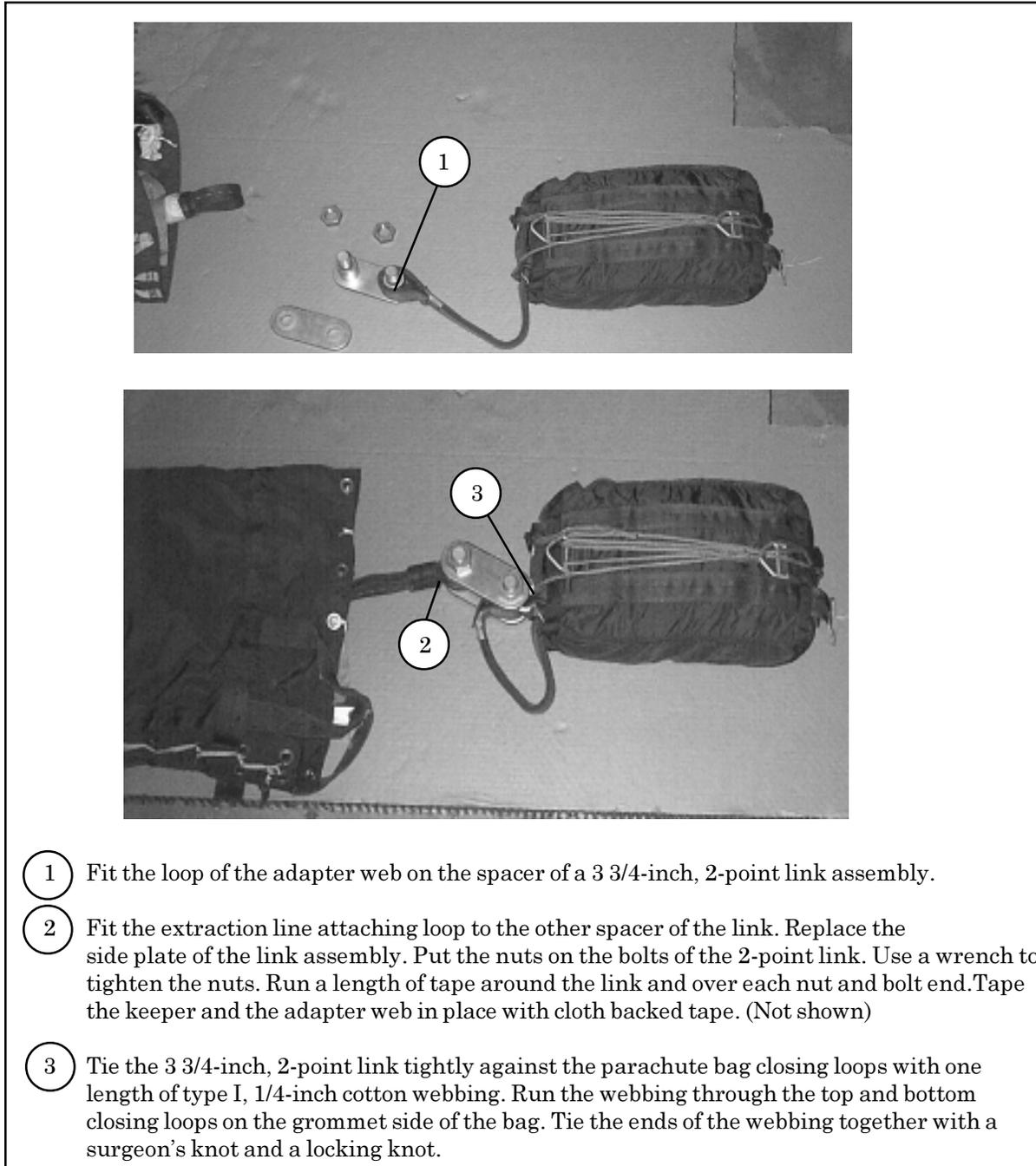
### C-130/MC-130 AIRCRAFT

3-28. The primary method of airdrop platform extractions uses a 60-foot extraction line attached to a cargo extraction parachute as detailed in the following paragraphs.

*a. One 15-Foot Cargo Extraction Parachute.*

(1) Attach a 60-foot (1-loop), type XXVI nylon webbing extraction line as shown in Figure 3-66.

(2) Attach the adapter web of the 15-foot extraction parachute as shown in Figure 3-66.

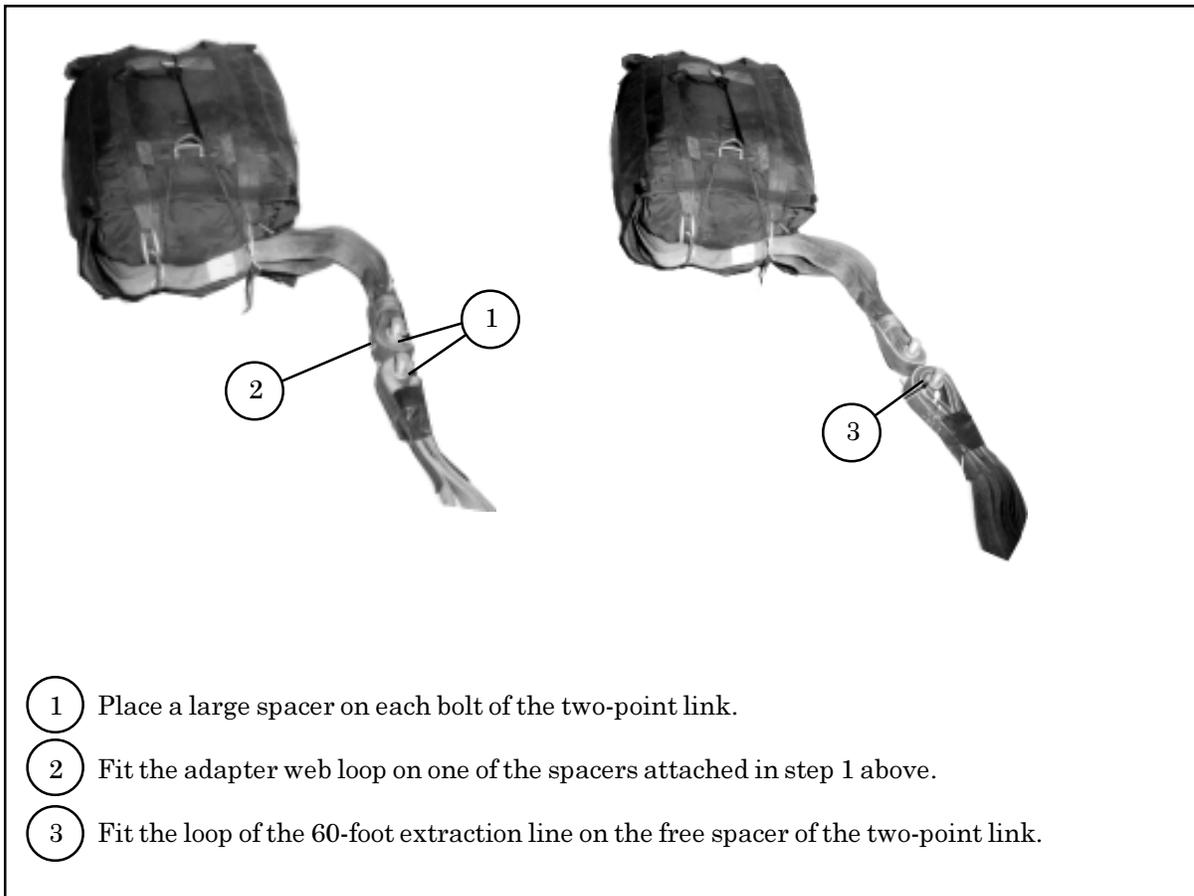


**Figure 3-66. Extraction Line Attached to 15-Foot Extraction Parachute**

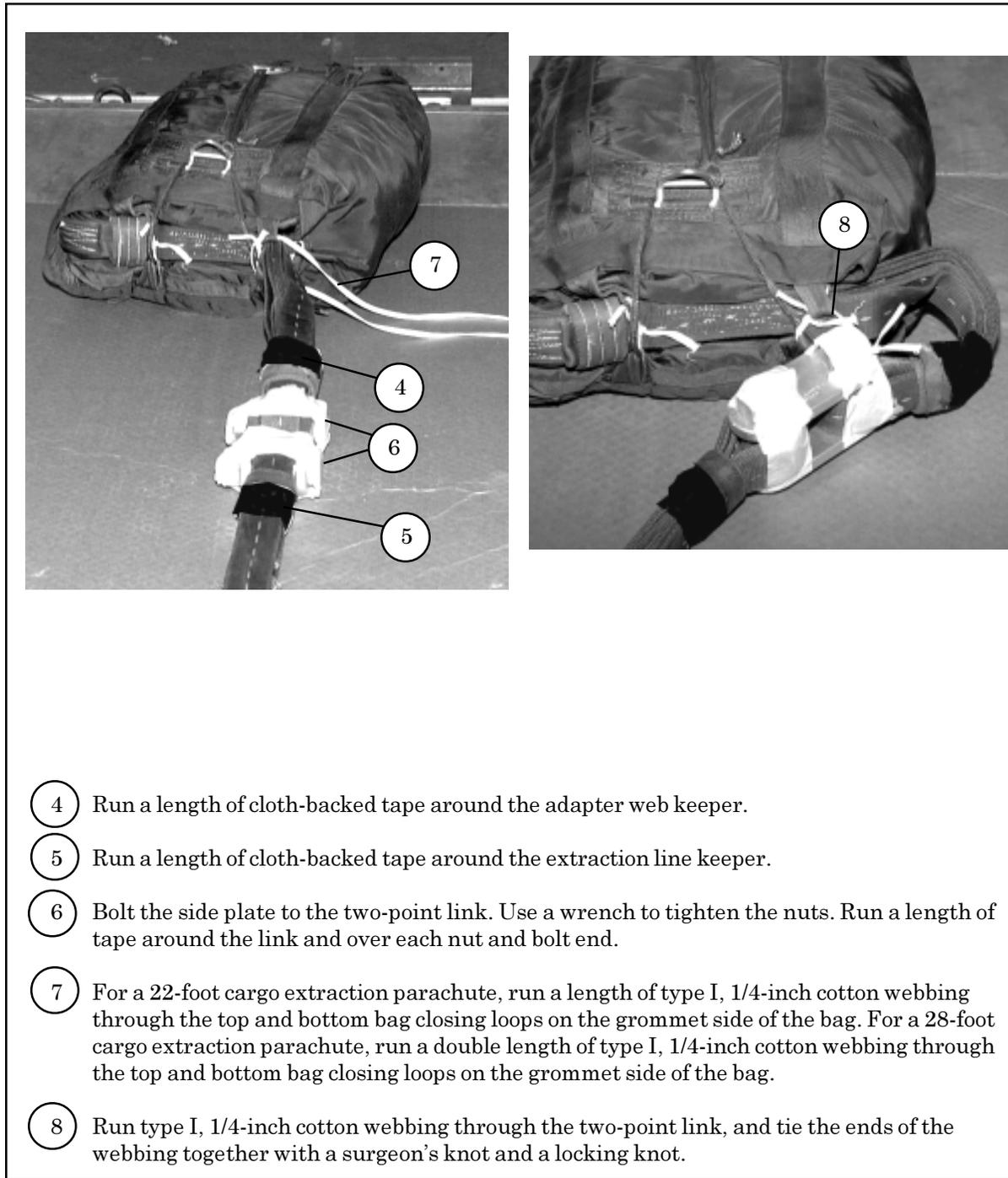
**b. One 22-Foot Cargo Extraction Parachute.** The 22-foot cargo extraction parachute uses a 60-foot (3-loop), type XXVI nylon webbing extraction line. Attach the line to the parachute by adapting the procedures shown in Figure 3-67 using a 3 3/4-inch, 2-point link.

**c. One 28-Foot Cargo Extraction Parachute.** The 28-foot, cargo extraction parachute uses a 60-foot (3-loop), type XXVI nylon webbing extraction line. Using a 5 1/2-inch, 2-point link, attach the line to the parachute by adapting the procedures shown in Figure 3-67.

**Note:** See Table 2-11 to determine the proper link assembly (3 3/4- or 5 1/2-inch) to use.



**Figure 3-67. Extraction Line Attached to 22- or 28-Foot Cargo Extraction Parachute With a 3 3/4- or 5 1/2-Inch, Two-Point Link Assembly**



- ④ Run a length of cloth-backed tape around the adapter web keeper.
- ⑤ Run a length of cloth-backed tape around the extraction line keeper.
- ⑥ Bolt the side plate to the two-point link. Use a wrench to tighten the nuts. Run a length of tape around the link and over each nut and bolt end.
- ⑦ For a 22-foot cargo extraction parachute, run a length of type I, 1/4-inch cotton webbing through the top and bottom bag closing loops on the grommet side of the bag. For a 28-foot cargo extraction parachute, run a double length of type I, 1/4-inch cotton webbing through the top and bottom bag closing loops on the grommet side of the bag.
- ⑧ Run type I, 1/4-inch cotton webbing through the two-point link, and tie the ends of the webbing together with a surgeon's knot and a locking knot.

**Figure 3-67. Extraction Line Attached to 22- or 28-Foot Cargo Extraction Parachute With a 3 3/4- or 5 1/2-Inch, Two-Point Link Assembly (Continued)**

**d. Two 28-Foot Cargo Extraction Parachutes.** A cluster of two 28-foot cargo extraction parachutes as shown in Figure 3-68, is attached to one end of a 60-foot (6-loop), type XXVI nylon webbing line. The other end of the line is attached to the four-point link assembly of the parachute cluster after the cluster has been installed in the aircraft.

## C-141 AIRCRAFT

3-29. A low-velocity airdrop platform load rigged for aerial delivery from a C-141 aircraft needs an extraction line based on the size of the extraction parachute. All extraction lines used on loads rigged for a C-141 aircraft must be continuous, type XXVI nylon webbing extraction lines. Attach the extraction line to the cargo extraction parachute as follows:

**a. One 15-Foot Cargo Extraction Parachute.** Attach a continuous 160-foot (1-loop), type XXVI nylon extraction line to the parachute by adapting procedures shown in Figure 3-66.

**b. One 22-Foot Cargo Extraction Parachute.** The 22-foot cargo extraction parachute needs a continuous 140-foot (3-loop), type XXVI nylon webbing extraction line. Attach the line to the parachute by adapting the procedures shown in Figure 3-67.

**c. One 28-Foot Cargo Extraction Parachute.** The 28-foot cargo extraction parachute needs a continuous 140-foot (3-loop), type XXVI nylon webbing extraction line. Attach the line to the parachute by adapting the procedures shown in Figure 3-67.

**d. Two 28-Foot Cargo Extraction Parachutes.** A cluster of two 28-foot cargo extraction parachutes, as shown in Figure 3-68 needs a continuous 120-foot (6-loop), type XXVI nylon webbing extraction line. The extraction line is attached to the four-point link assembly of the parachute cluster after the cluster has been installed in the aircraft.

## EXTRACTION PARACHUTE CLUSTERS

3-30. Cluster two 28-foot cargo extraction parachutes for an initial extraction as shown in Figure 3-68 and for a sequential extraction as shown in Figure 3-69.

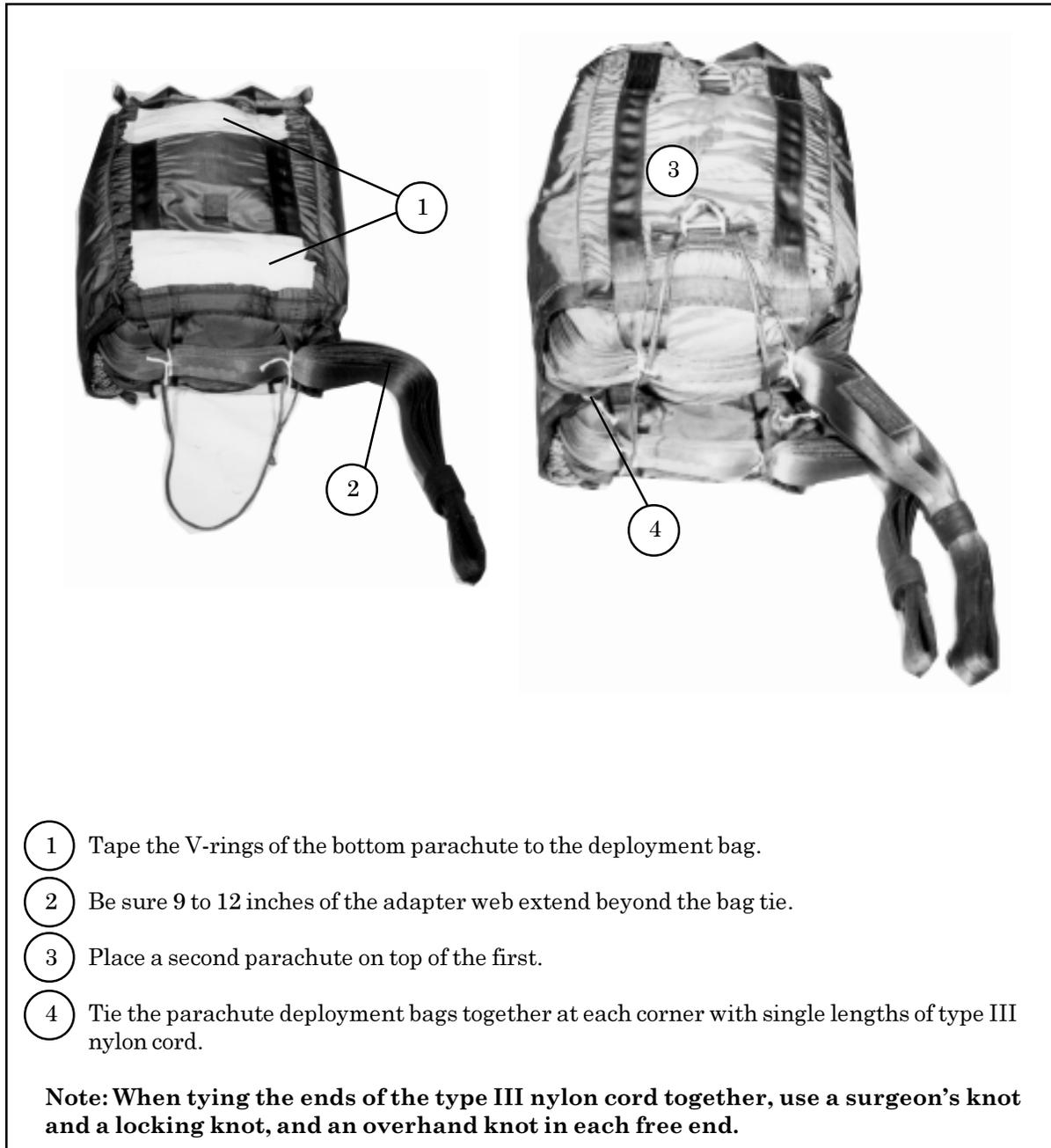
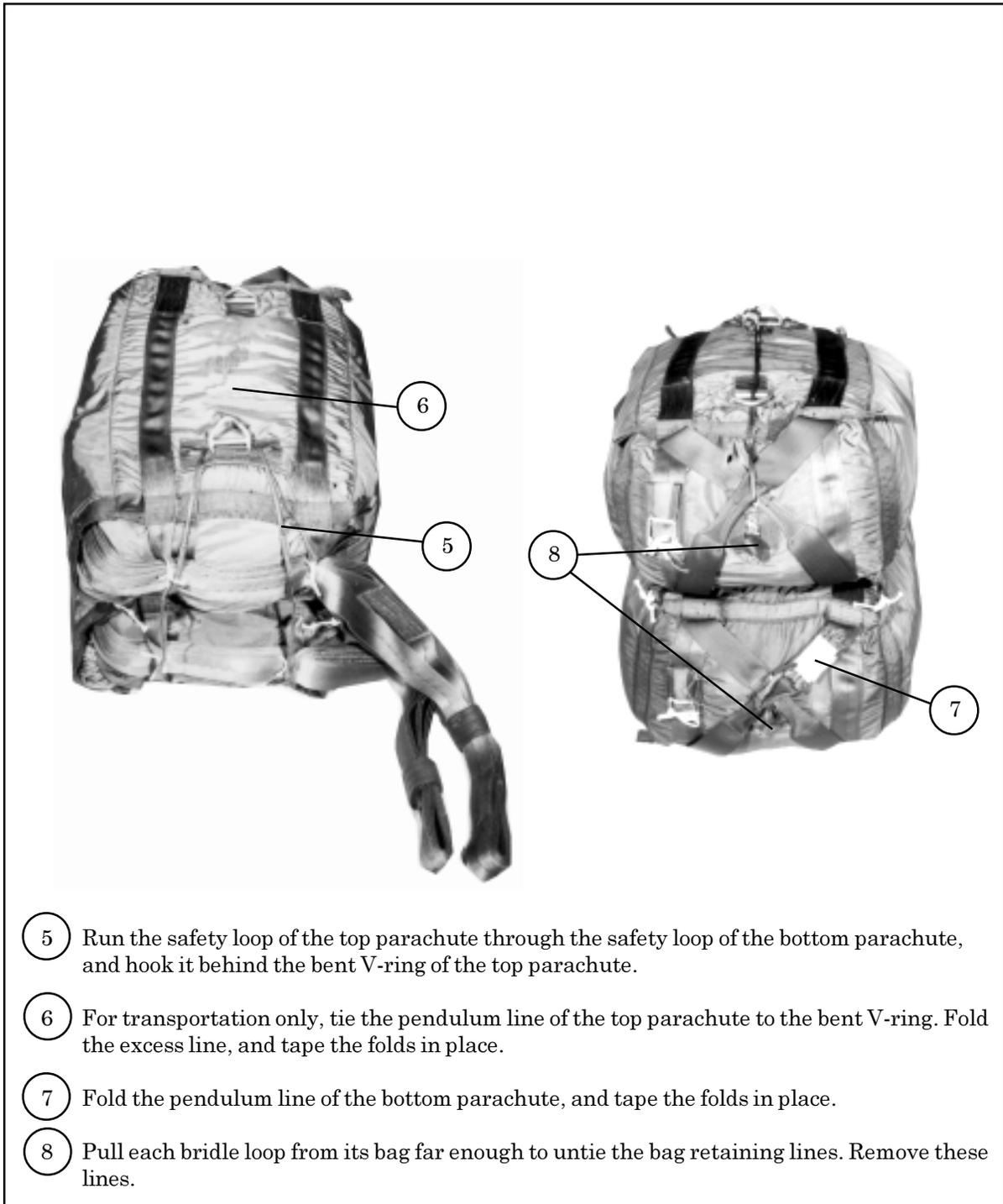
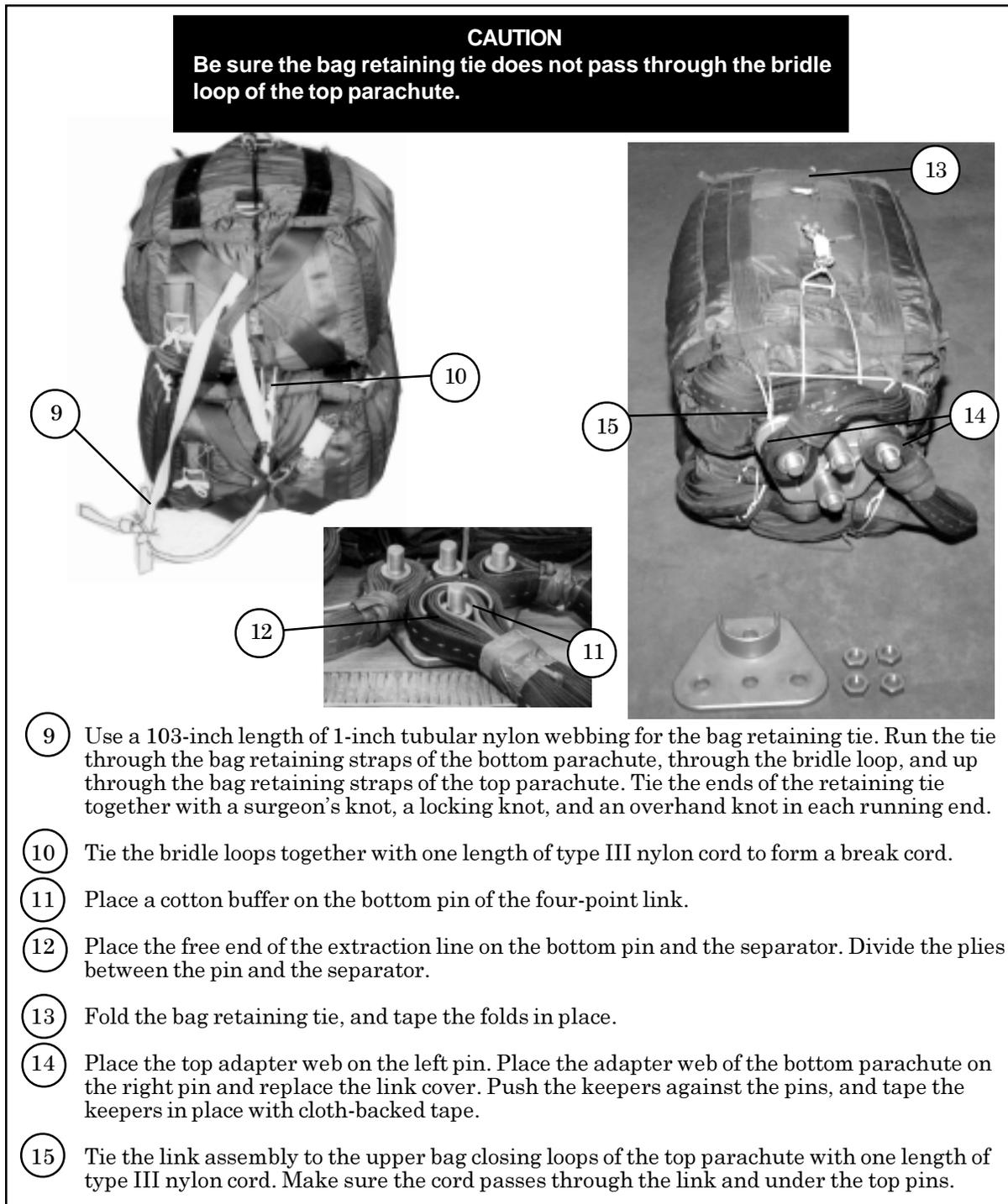


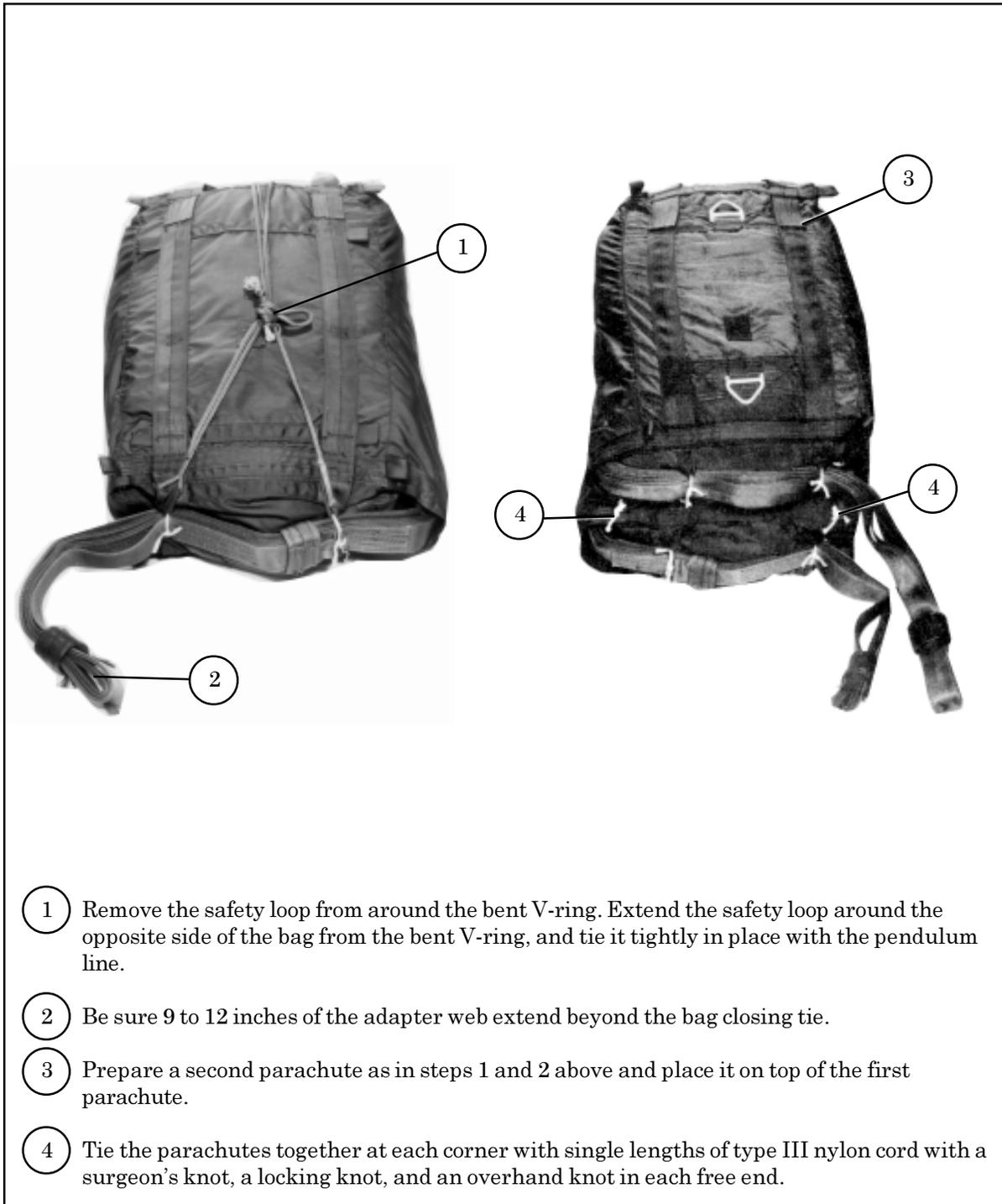
Figure 3-68. Clustering Extraction Parachutes for an Initial Extraction from C-130/C-141 Aircraft



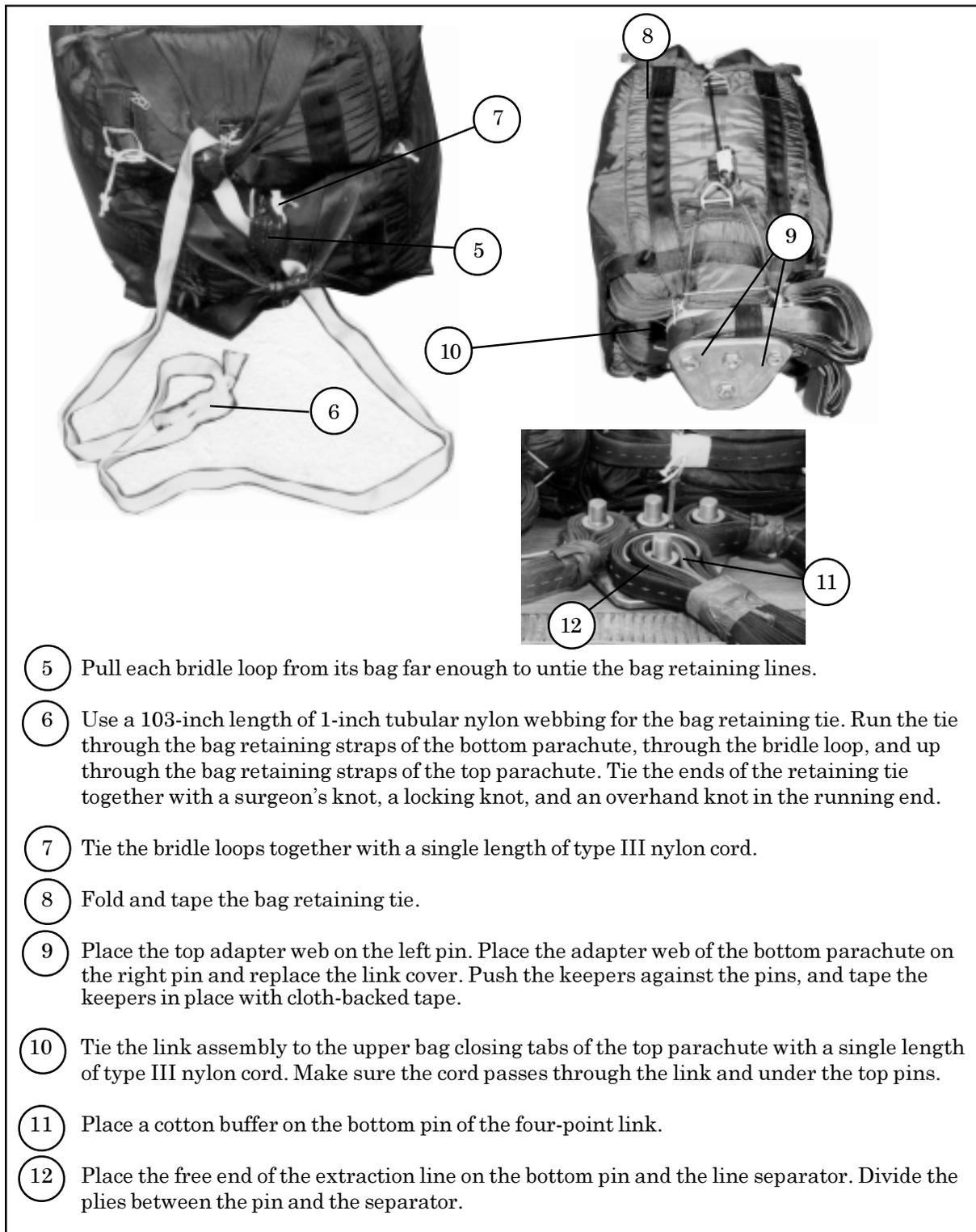
**Figure 3-68. Clustering Extraction Parachutes for an Initial Extraction from C-130/C-141 Aircraft (Continued)**



**Figure 3-68. Clustering Extraction Parachutes for an Initial Extraction from C-130/C-141 Aircraft (Continued)**



**Figure 3-69. Clustering Extraction Parachutes for a Sequential Extraction**



**Figure 3-69. Clustering Extraction Parachutes for a Sequential Extraction (Continued)**

## C-5 AIRCRAFT

3-31. A low-velocity airdrop platform load rigged for delivery from a C-5 aircraft needs an extraction line based on the size of the extraction parachute and the platform's location within the aircraft. Because extraction line length varies depending on the platform's location within the aircraft, attachment of cargo extraction parachutes to extraction lines and joining of extraction lines shall be accomplished after the platform is loaded aboard the aircraft. Attach the extraction line to the cargo extraction parachute and join extraction lines as follows.

**a. One 15-Foot Cargo Extraction Parachute.** Attach a continuous 160-foot (1-loop), type XXVI nylon webbing extraction line to the parachute by adapting the procedures shown in Figure 3-66. Platform loads using a 15-foot cargo extraction parachute must be positioned so that the rear edge of the platform is located between aircraft fuselage stations (FSs) 1187 and 1971.

**b. One 22-Foot Cargo Extraction Parachute.** Attach the extraction line to the extraction parachute and join extraction lines as follows.

(1) Rear edge of the platform located between aircraft FSs 1427 and 1971. The 22-foot cargo extraction parachute needs a continuous 140-foot (3-loop), type XXVI nylon webbing extraction line. Attach the line to the parachute by adapting the procedures shown in Figure 3-67.

(2) Rear edge of the platform located between aircraft FSs 707 and 1426. The 22-foot cargo extraction parachute needs a 60-foot (3-loop), type XXVI nylon webbing extraction line; a 140-foot (3-loop), type XXVI nylon webbing extraction line; and a 5 1/2-inch, two-point link assembly. Attach the 60-foot extraction line to the parachute by adapting the procedures shown in Figure 3-70. Join the 140-foot extraction line to the 60-foot extraction line by adapting the procedures shown in Figure 3-70.

**c. One 28-Foot Cargo Extraction Parachute.** Attach the extraction line to the extraction parachute and join extraction lines as follows.

(1) Rear edge of the platform located between aircraft FSs 1427 and 1971. The 28-foot cargo extraction parachute needs a continuous 140-foot (3-loop), type XXVI nylon webbing extraction line. Attach the line to the parachute by adapting the procedures shown in Figure 3-67.

(2) Rear edge of the platform located between aircraft FSs 707 and 1426. One 28-foot cargo extraction parachute needs a 60-foot (3-loop), type XXVI nylon webbing extraction line; a 140-foot (3-loop), type XXVI nylon webbing extraction line; and a 5 1/2-inch, two-point link assembly. Attach the 60-foot extraction line to the parachute by adapting the procedures shown in Figure 3-67. Join the 140-foot extraction line to the 60-foot extraction line by adapting the procedures shown in Figure 3-70.

**d. Two 28-Foot Cargo Extraction Parachutes.** A cluster of two 28-foot cargo extraction parachutes is prepared for an initial extraction as shown in Figure 3-72 and for a sequential extraction as shown in Figure 3-69. Attach the extraction line to the extraction parachutes and join extraction lines as follows.

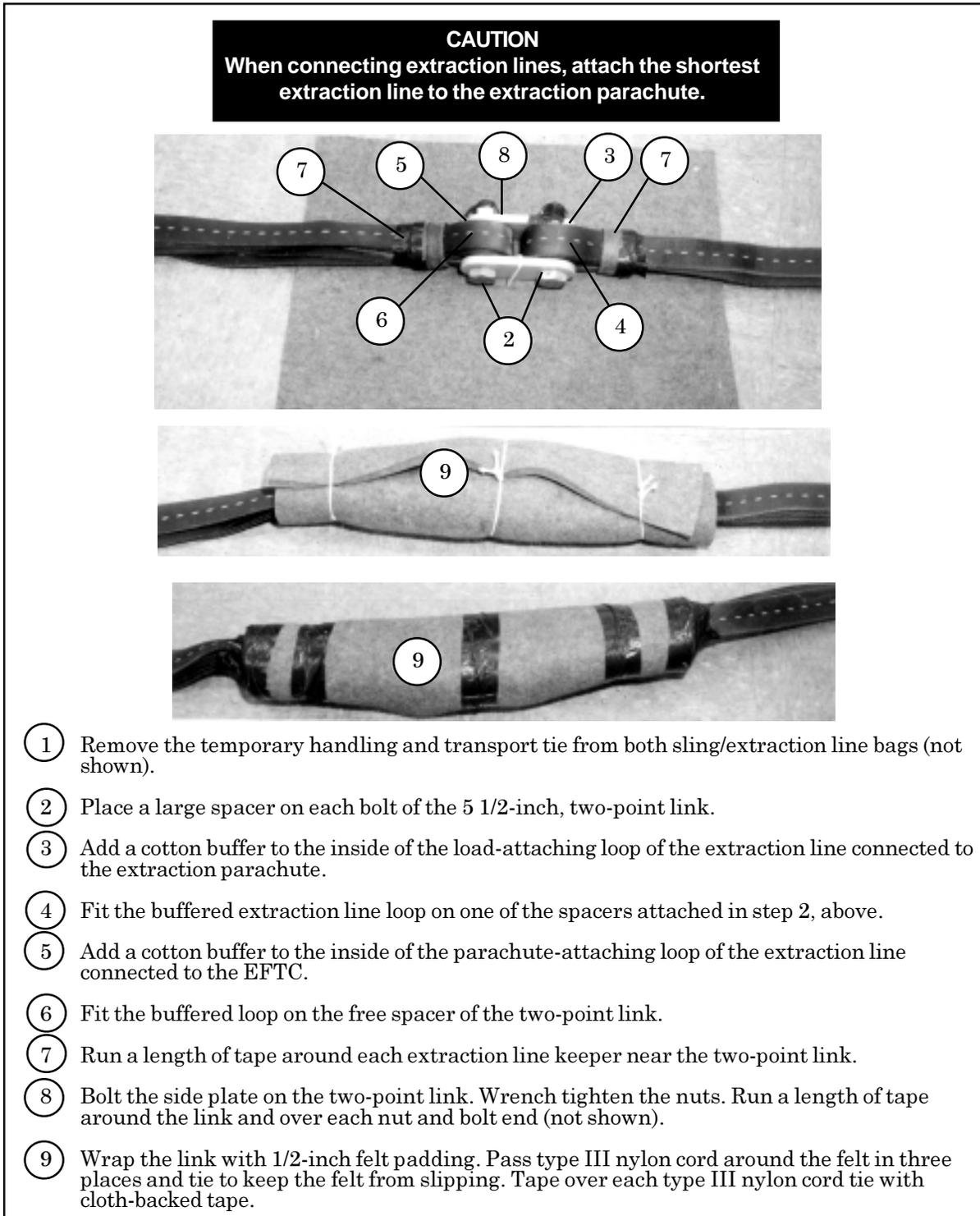
(1) Rear edge of the platform located between aircraft FSs 1667 and 1971. Two 28-foot cargo extraction parachutes need a continuous 120-foot (6-loop), type XXVI nylon webbing extraction line and a four-point link assembly. The extraction line is attached to the four-point link assembly of the parachute cluster after the cluster has been installed in the aircraft.

(2) Rear edge of the platform located between aircraft FSs 947 and 1666. Two 28-foot cargo extraction parachutes need a 60-foot (6-loop), type XXVI nylon webbing extraction line; a 120-foot (6-loop), type XXVI nylon webbing extraction line; a four-point link assembly; and an extraction line coupler assembly. Attach the 60-foot extraction line to the four-point link assembly of the parachute cluster after the cluster has been installed in the aircraft. Join the 120-foot extraction line to the 60-foot extraction line by adapting the procedures shown in Figure 3-71.

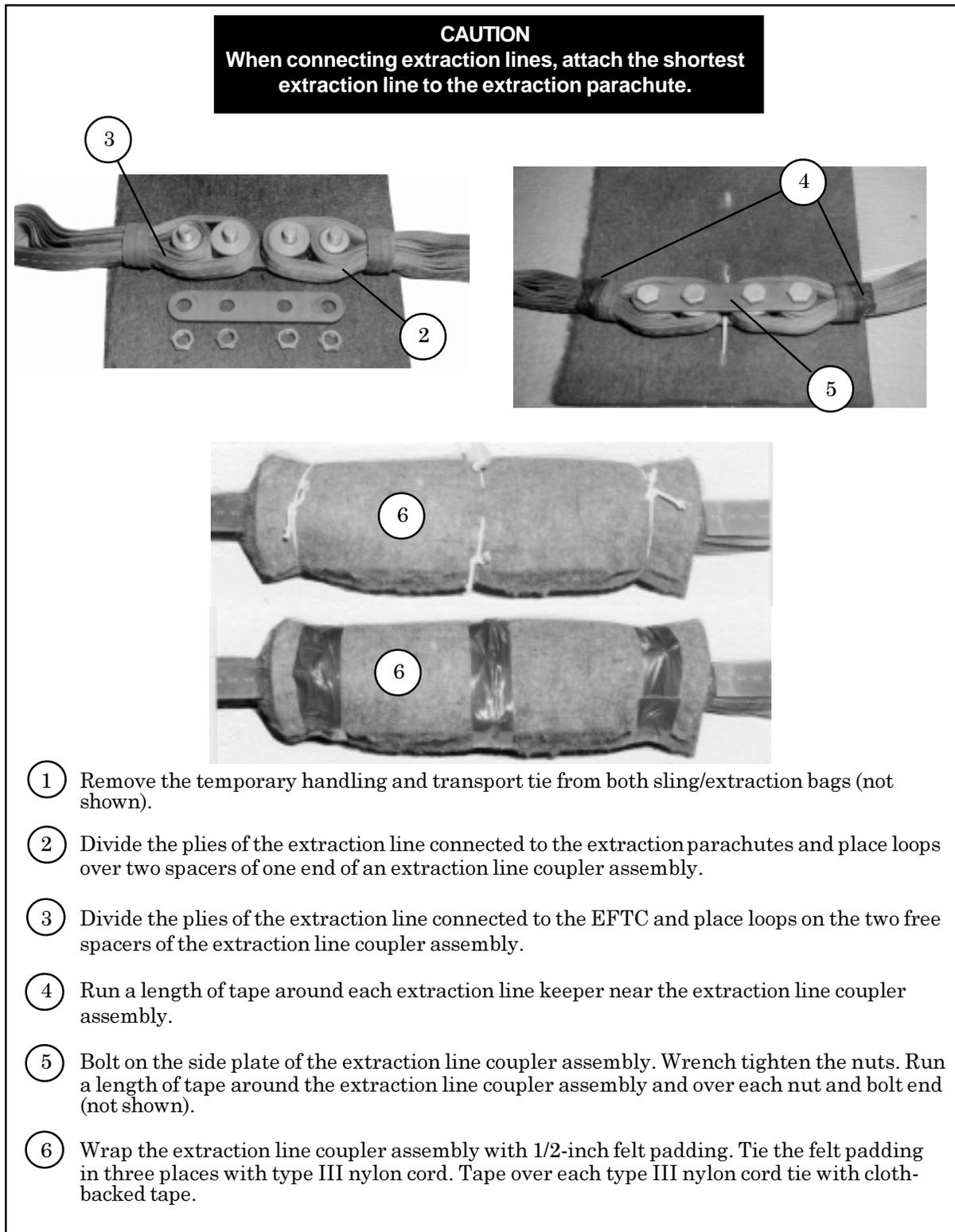
(3) Rear edge of the platform located forward of aircraft FSs 947. Two 28-foot cargo extraction parachutes need two 120-foot (6-loop), type XXVI nylon webbing extraction lines; a four-point link assembly; and an extraction line coupler assembly. Attach a 120-foot extraction line to the four-point link assembly of the parachute cluster after the cluster has been installed in the aircraft. Join the two 120-foot extraction lines together by adapting the procedures shown in Figure 3-71. Clustering extraction parachutes for an initial extraction from a C-5 aircraft is shown in Figure 3-72.

**e. Derigged 28-Foot Cargo Extraction Parachutes.** Clustered 28-foot extraction parachutes must be derigged for an initial extraction as follows.

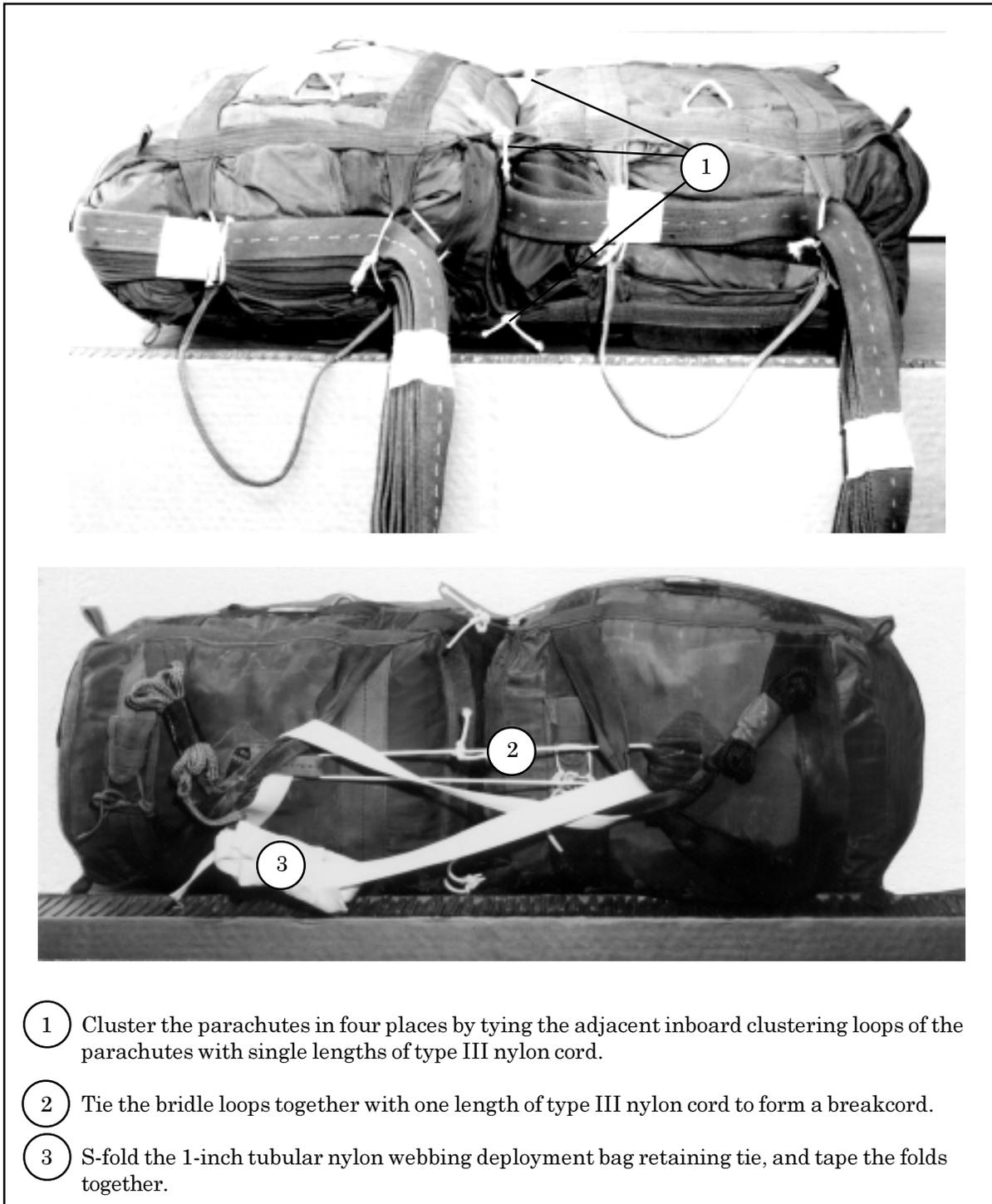
- (1) Remove the four-point link assembly.
- (2) Remove the deployment bag clustering ties.
- (3) Remove the parachutes' bridle loop tie.
- (4) Remove tape from the deployment bag retaining tie. Do not remove the tie.
- (5) S-fold each pendulum line, and tape each fold to its deployment bag.



**Figure 3-70. Connecting Type XXVI (3-Loop) Extraction Lines Together for C-5 Airdrop**



**Figure 3-71. Connecting Type XXVI (6-Loop) Extraction Lines Together for C-5 Airdrop**



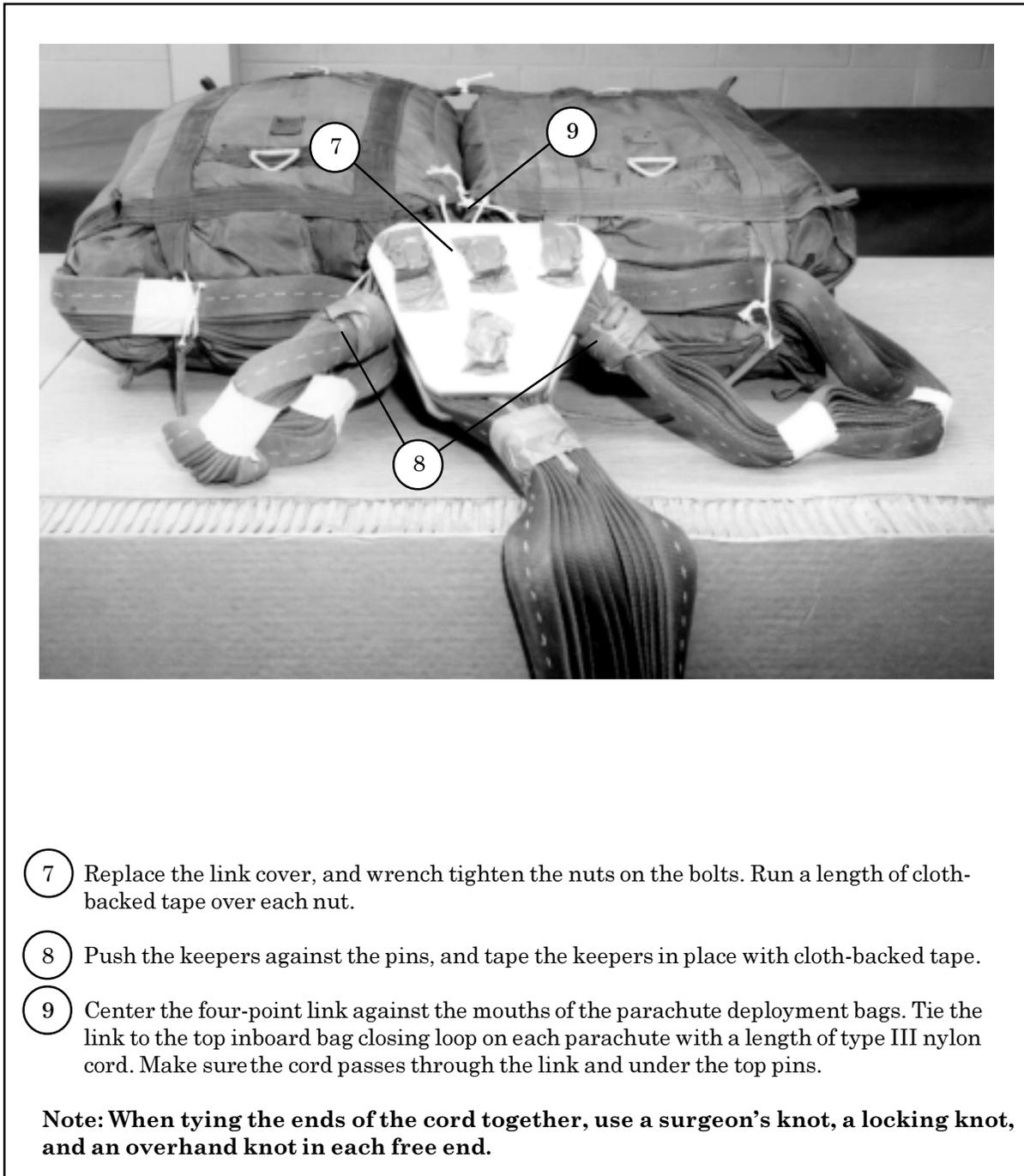
- ① Cluster the parachutes in four places by tying the adjacent inboard clustering loops of the parachutes with single lengths of type III nylon cord.
- ② Tie the bridle loops together with one length of type III nylon cord to form a breakcord.
- ③ S-fold the 1-inch tubular nylon webbing deployment bag retaining tie, and tape the folds together.

**Figure 3-72. Clustering Extraction Parachutes for an Initial Extraction from C-5 Aircraft**



- 4 Place the left parachute adapter web loop on the top left pin of a four-point link assembly. Place the right parachute adapter web loop on the top right pin.
- 5 Place a cotton buffer on the bottom pin of the four-point link.
- 6 Place the free end of the extraction line on the bottom pin and the line separator. Divide the plies between the pin and the separator.

**Figure 3-72. Clustering Extraction Parachutes for an Initial Extraction from C-5 Aircraft (Continued)**



**Figure 3-72. Clustering Extraction Parachutes for an Initial Extraction from C-5 Aircraft (Continued)**

## Section VIII

# Load Marking, Inspection, and Emergency Aft Restraint Requirements

## MARKING RIGGED LOAD

3-32. Each rigged load must have a data tag prepared for it, and some rigged loads may require a Shipper's Declaration for Dangerous Goods. The center of balance must also be clearly marked on both sides of the platform.

**a. Data Tag.** A data tag is prepared and secured to each platform load near the extraction system. Entries on the tag are used by the Army and Air Force in making inspections and in finding causes for malfunctions. The entries are also used to help the loadmaster determine where to place the load in the aircraft. Use a ballpoint pen or other waterproof marking device to record the following information on the tag:

- (1) Total rigged weight.
- (2) Height, including parachutes.
- (3) Width.
- (4) Overall length.
- (5) Overhang (specify front, rear, or side of load).
- (6) Longitudinal center of balance (measured from the front edge of the platform).
- (7) Type and size of extraction system.

**b. Shipper's Declaration for Dangerous Goods.** This form is prepared and secured on each load that has any type of hazardous material such as fuel, ammunition, or a battery.

**c. Center of Balance.** In addition to being included on the data tag, the longitudinal center of balance must also be marked on the platform. The vertical line of the symbol CB is placed at the center of balance on both sides of the platform.

## TYPES OF INSPECTIONS

3-33. The types of inspections performed on a rigged load are the final rigger inspection, the before-loading inspection, and the after-loading inspection. All rigged low-velocity loads must be inspected at prescribed intervals to make sure that the loads and the equipment used on the loads are assembled and installed to meet the criteria outlined in the specific rigging manual.

**a. Final Rigger Inspection (Shop Final).** After the load has been completely rigged, a certified Transported Force rigger inspector performs the final rigger inspection. This inspection is accomplished before the rigged load leaves the rigging site to make sure it is rigged according to the specific field manual/technical order for that particular load. This inspection should be conducted by an inspector other than the rigger supervising the installation of parachutes and extraction system. It is not necessary to use the DD Form 1748-series inspection forms for this inspection.

**b. Before-Loading Inspection.** A before-loading inspection must be performed on a rigged load before it is loaded into the aircraft. This inspection is conducted jointly by a certified Transported Force rigger inspector and a certified Air Force Joint Airdrop Inspector. The inspectors use the proper joint airdrop inspection record, and both sign the appropriate blocks to certify correct rigging of the load. When the rigged load is delivered to the aircraft, the aircraft loadmaster checks the inspection form for completion and necessary signatures before accepting the load.

**c. After-Loading Inspection.** After the loadmaster completes the loading and in-aircraft rigging, the after-loading inspection is performed. This inspection is conducted jointly by a certified Transported Force rigger inspector and a certified Air Force Joint Airdrop Inspector, and the aircrew loadmaster. After the inspection is completed, the three inspectors certify, by signing the form, that the load is ready to airdrop.

**EMERGENCY AFT RESTRAINT REQUIREMENTS FOR PLATFORM-EXTRACTED LOADS RIGGED ON A TYPE V PLATFORM**

3-34. Use Tables 3-2, 3-3, and 3-4 as guides for determining the emergency aft restraint requirements for platform-extracted loads rigged on a type V platform.

**Table 3-2. Emergency Aft Restraint Requirements for Platform-Extracted Loads Rigged on a Type V Platform for Airdrop from a C-130 Aircraft**

Cargo Extraction Parachute	Chains Required	Attachment Provision
15-foot	Two 10,000-pound. One chain to each clevis.	Two medium suspension clevises. One clevis is attached to the top emergency aft restraint provision hole of each front tandem link.
22-foot	Four 10,000-pound. One chain to each clevis.	Four medium suspension clevises. Two clevises are attached to the top two emergency aft restraint provision holes of each front tandem link.
One 28-foot or *Two 28-foot	Six 10,000-pound. One chain to each clevis.	Six medium suspension clevises. Two clevises are attached to the top two emergency aft restraint provision holes of each front tandem link. The third clevis is attached to the front tandem link hole.

**WARNING**  
 \*This emergency aft restraint is used only to secure a loose platform in the aircraft if the right hand locks release prior to green light.

**Table 3-3. Emergency Aft Restraint Requirements for Platform-Extracted Loads Rigged on a Type V Platform for Airdrop from a C-141 Aircraft**

<b>Cargo Extraction Parachute</b>	<b>Chains Required</b>	<b>Attachment Provision</b>
15-foot	Two 10,000-pound. One chain to each clevis or Two 25,000-pound. One chain to each clevis.	Two medium suspension clevises. One clevis is attached to the top emergency aft restraint provision hole of each front tandem link.
22-foot	Four 10,000-pound. One chain to each clevis or  Two 25,000-pound. One chain to each clevis.	Four medium suspension clevises. Two clevises are attached to the top two emergency aft restraint provision holes of each front tandem link.  Two medium suspension clevises. One clevis is attached to the top emergency aft restraint provision hole of each front tandem link.
One 28-foot	Six 10,000-pound. One chain to each clevis or  Two 25,000-pound. One chain to each clevis.	Six medium suspension clevises. Two clevises are attached to the top two emergency aft restraint provision holes of each front tandem link. The third clevis is attached to the front tandem link hole.  Two medium suspension clevises. One clevis is attached to the top emergency aft restraint provision hole of each front tandem link.
Two 28-foot	Four 25,000-pound. One chain to each clevis.	Four medium suspension clevises. Two clevises are attached to the top two emergency aft restraint provision holes of each front tandem link.

**Note: The above combinations are based on the restraint requirements of one and one-half times the towed extraction force which is stated in reference pounds. In all cases, the tandem link is rated for 40,000 pounds.**

**Table 3-4. Emergency Aft Restraint Requirements for Platform-Extracted Loads Rigged on a Type V Platform for Airdrop from a C-5 Aircraft**

<b>Cargo Extraction Parachute</b>	<b>Chains Required</b>	<b>Attachment Provision</b>
15-foot	Two 25,000-pound. One chain to each clevis.	Two medium suspension clevises. One clevis is attached to the top emergency aft restraint provision hole of each front tandem link.
22-foot	Two 25,000-pound. One chain to each clevis.	Two medium suspension clevises. One clevis is attached to the top emergency aft restraint provision hole of each front tandem link.
One 28-foot	Two 25,000-pound. One chain to each clevis.	Two medium suspension clevises. One clevis is attached to the top emergency aft restraint provision hole of each front tandem link.
Two 28-foot	Four 25,000-pound. One chain to each clevis.	Four medium suspension clevises. Two clevises are attached to the top two emergency aft restraint provision holes of each front tandem link.

**Note: The above combinations are based on the restraint requirements of one and one-half times the towed extraction force which is stated in reference pounds. In all cases, the tandem link is rated for 40,000 pounds.**

## GLOSSARY

ACB	attitude control bar
AD	airdrop
AFB	Air Force base
AFJMAN	Air Force Joint Manual
AFR	Air Force regulation
AFTO	Air Force technical order
ALC	Airlift Logistics Center
attn	attention
C	change
cap	capacity
CB	center of balance
chap	chapter
CRRC	combat rubber raiding craft
d	penny
DA	Department of the Army
DC	District of Columbia
DD	Department of Defense
DES	drogue extraction system
diam	diameter
EFTC	extraction force transfer coupling
fig	figure
fs	fuselage station
FM	field manual
ft	foot/feet
gal	gallon
HMMWV	high mobility multipurpose wheeled vehicle
HQ	headquarters
in	inch
JAI	joint airdrop inspector
lb	pound
MAJCOM	Major Command
LV	low-velocity
MCRP	Marine Corps Reference Publication
mm	millimeter
NSN	national stock number
OVE	on-vehicular equipment
TM	technical manual
TO	technical order
TRADOC	US Army Training and Doctrine Command
US	United States
wt	weight
w	with
yd	yard

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By Order of the Secretary of the Army and the Air Force:

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